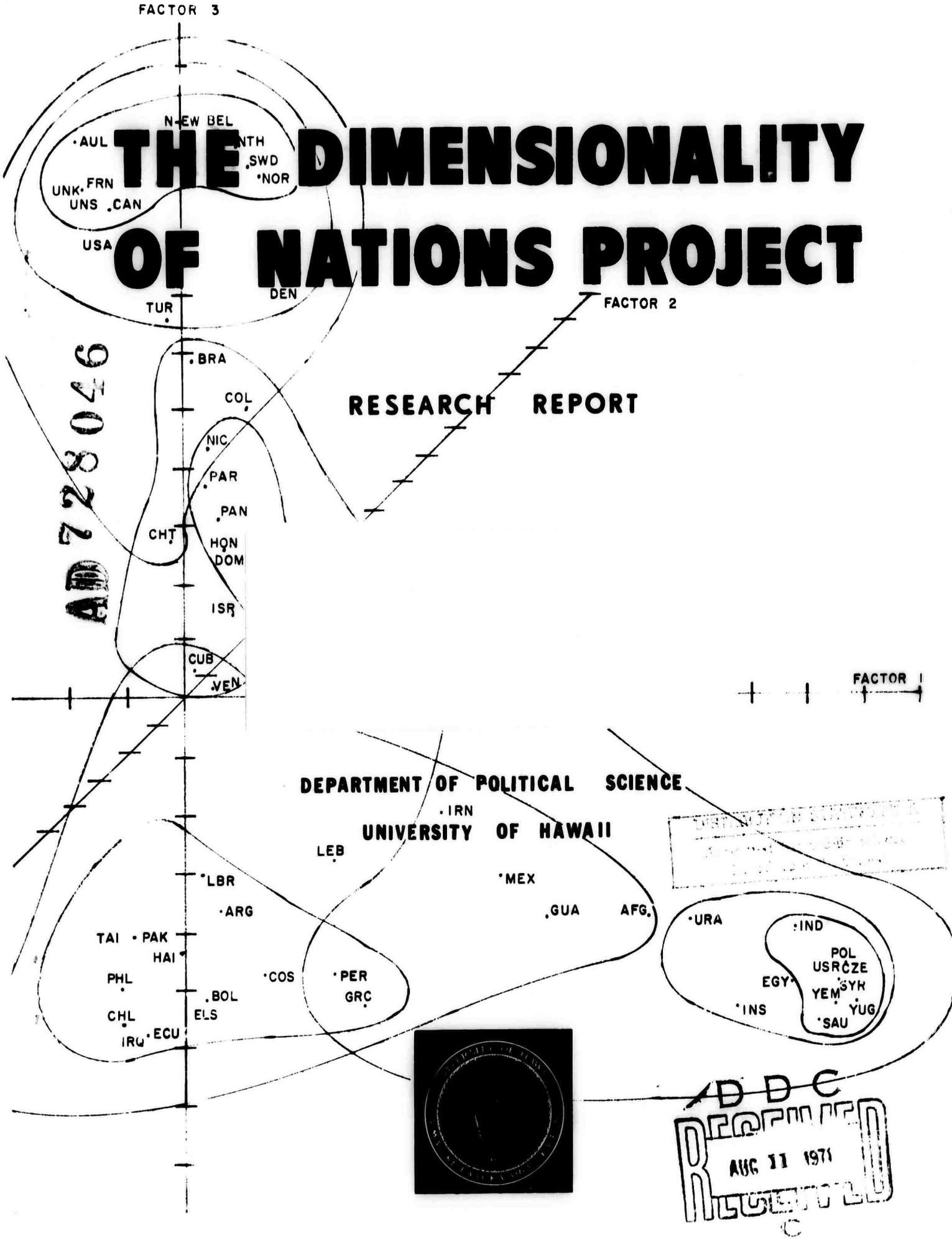

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RESEARCH REPORT

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COMMUNIST CHINA'S FOREIGN BEHAVIOR: AN APPLICATION OF FIELD THEORY MODEL II

Sang Woo Rhee

July 1971

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13. ABSTRACT

This is a study of Communist China's contemporary foreign behavior patterns. The purpose of the research is to explain Communist China's system of foreign relations by examining her differences and similarities with each other nation.

Rummel's field theory guides this study. Applying this theory, a theoretical model of foreign behavior decision-making system was formulated. The research has focused on determining China's idiosyncratic systems of both perceptions of attribute distances and behavioral preferences.

The findings include the following: 1) Linear linkage between the attribute distances of the nations from China and China's behavior toward those nations, which was proposed by field theory, was found to exist within a satisfactory margin of error. 2) China's joint conflict behavior and trading behavior toward other nations is the function of the power distance between China and the object nation. 3) In general, attribute differences between China and other nations explain about fifty-three percent of the variation in China's foreign behavior toward them.

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
China						
Foreign Behavior						
Field Theory						
Factor Analysis						
Canonical Analysis						
Behavioral Pattern						
Foreign Policy Decision Making						

To

Professor Han-Key Lee

who made me a scholar

and

Professor R. J. Rummel

who made me a political scientist.

COMMUNIST CHINA'S FOREIGN BEHAVIOR: AN APPLICATION OF FIELD THEORY MODEL II

By Sang Woo Rhee

A dissertation submitted to the Graduate Division of the University of Hawaii in partial fulfillment of the requirements for the degree of Doctor of Philosophy

ABSTRACT

This is a study of Communist China's contemporary foreign behavior patterns. The purpose of the research is to explain Communist China's system of foreign relations by examining her differences and similarities with each other nation.

Rummel's field theory, which states that "the behavior of one nation toward another is a linear transformation of their differences from each other on their attributes," guides this study. Applying this theory, a theoretical model of foreign behavior decision-making system was formulated. In the model, the objective attribute distances are related to the final behavior through perceptual framework and behavioral preference systems. First, the decision-makers of China perceive the relative distances of China from all other nations on various attributes through their own filtering system or unique perceptual framework. As a consequence, the same distances may be felt differ-

ently by Chinese decision-makers than by others. Second, when the Chinese decision-makers decide their behavior, the perceived distances are again modified by their idiosyncratic behavioral preference systems before they determine their final decision. Applying this model, the research has focused on determining China's idiosyncratic systems of both perceptions of attribute distances and behavioral preferences.

Data were collected on thirty-five attribute variables which measure the attribute distances of eighty-one nations from China and of seventeen behavioral variables which measured China's behavior *vis-à-vis* those nations for 1955 and 1963. Both matrices of data (attribute and behavioral) were factor-analyzed to get sets of basis dimensions of the two matrix spaces and the socres of the dimensions were used in the analysis.

The findings of the study include the following:

1) Linear linkages between the attribute distances of the nations from China and China's behavior toward those nations, which was proposed by field theory, was found to exist within a satisfactory margin of error. This finding strongly supports the validity of field theory.

2) China's foreign behavior patterns were delineated in the form of seven canonical structure equations, some of which say that

a. China's joint conflict behavior and trading behavior toward other nations is the function of the power distance between China and the object nation;

b. China's formal diplomacy is determined by the object's political orientation;

c. China's political penetration was directed to world rural areas--underdeveloped, non-Communist agricultural areas where the Soviet influence is weak.

3) In general, attribute differences between China and other nations explain about fifty-three percent of the variation in China's foreign behavior toward them.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

China, long a "sleeping lion" of Asia, is now awakening. In the past twenty years, she has been transformed from a semi-colonized prey of the Powers to a formidable giant, with a well-organized population of eight hundred million and the largest army in the world Although economically, China is still a second-rate power, at best,[1] no one can deny her influential position in th present international political arena.

On April 25, 1970, the *Hsien-hua News Agency* reported that the People's Republic of China had launched her first satellite into orbit on the previous day. The 173 kilogram "Mao's Moon" (so christened by an Italian newspaper) broadcasted the Chinese, semi-official national anthem, "The East is Red" for forty seconds, every five minutes, as it passed over the ninety capitals of the world.[2] The satellite's impact on all nations will be great, not only because it implies China's approaching capability to build and use ICBM's, the formidable symbol

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[1]North, 1969, p. 22.

[2]*The Chosen Ilbo*, April 26, 1970, p. 1 and April 28, 1970, p. 3.

of the super power,[3] but also because it dramatically demonstrates China's technical capability which, without doubt, will affect the patterns of her foreign behavior.

China's behavior has already had a strong impact on both her enemies and friends, and she will play an even greater role in international politics in the future. China is no longer a mere object of world politics. She is one of the powers which shape and lead it. The study of her foreign behavior is now one of the most needed in the field of international relations, for, without this knowledge, we can say little about world politics or world peace.

1.1 The Theoretical Perspective of This Study

The study presented here has two aims: First, the assessment of the validity of the major theme of Rummel's field theory,[4] and second, the development of an empirically applicable general model of China's foreign behavior based on field theory. By "empirically applicable" I mean that the model generated will be operational in that the practitioners of world politics can utilize it directly to

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[3]The Chinese have already exploded a missile-type H-bomb warhead. The first nuclear warhead carried by a guided missile was tested on October 27, 1966, which was her fourth test of a nuclear weapon (the first explosion was on October 16, 1964). For a detailed chronology of Chinese nuclear tests, see Yahuda, 1969, 198-9. *Time* (May 11, 1970, pp. 44-7) predicted that China would possess, at the latest, within 1970 at least some IRBMs with a range of 1,000 miles.

[4]The theory is still in the developing stage; parts of it, therefore, are continuously changing. However, the major theme of the theory (linear linkage between behavior and attribute difference) has been unchanged. Hereafter when field theory is referred to, if not specified otherwise, it means the one in Rummel, 1965.

get information about China's foreign behavior. By "general" I mean that the model should be applicable to any kind of behavior, at any point, in any circumstance and directed toward any object nation.

Most of the theories or models currently being developed in the field of international studies seem to be either so intricate as to defy operational definition, or so abstract as to relate to "world reality" in only the most remote way, or so specific to one aspect of national behavior as to lose general applicability. To be empirically applicable, in the above-mentioned sense of being useful to a practitioner, a theory or model should be general in scope, simple in form and operational in terms of measurable variables.

The major proposition of field theory is that "the behavior of one nation toward another is a linear transformation of their differences from each other on their attributes." Field theory is a general one applicable to all kinds of social units[5] and to all kinds of behavior, and takes one simple form to describe the proposed linkage between a nation's behavior and her attribute differences from others. The linkage equation is, $WQ = DP + U$, where W is a set of behavioral vectors, D is a set of attribute differences, P and Q are weightings, and U is an error matrix.[6] In this sense, the theory meets the first two of the three criteria of an empirically applicable model specified above: generality and simplicity.

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[5]Rummel, 1969b, p. 10.

[6]This equation will be discussed in detail in Chapter 3.

The main statement of field theory, however, is in a highly abstract form saying that there are linear relations between a nation's behavior and her differences and similarities with each other nation. The theory itself does not specify which behavior is related to which difference nor how they are related. In other words, in the above matrix equation, P and Q are not "theorized" by the model itself. Therefore, the theory is "abstract" and is not, by itself, related to the real world directly. In order to make the model complete for a particular nation, we need to specify the values of P and Q. The purpose of this study is to test precisely an empirically applicable model derived from field theory for Communist China by giving fixed numbers to P and Q in the above equation.

Field theory is a theory in the sense that it includes a universal generalization, *i.e.*, the statement that describes the relation between "the behavior of one nation toward another" and "their differences from each other on their attributes." The form of the relation is theorized as a "linear transformation." This proposition is regarded as a law, *i.e.*, the form of relations between behavior and the differences specified are theorized to be valid for any actor nation at any historical time point. A law remains a law insofar as the proposition is "corroborated" by experience.[7] In other words, if the proposed statement withstands empirical tests and is not falsified by the test, it remains a law.

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[7]See Popper, 1968, p. 33.

The first aim of this study was to test the validity of the statement of linear linkage between behavior and attribute differences with empirical data. If the proposed linear relationship were assessed by test results, *i.e.*, if high correlations were obtained from a linear fit, the theory is valid for the moment.

The second aim of this study was to formulate an empirically applicable model for China's foreign behavior based on field theory. As mentioned above, in field theory, the form of the relationship between a nation's behavior and her differences from each other nation on attributes is defined in a general form, a linear transformation, and the actual concrete relationship is left undefined. To make an empirically applicable model out of field theory, then, we need to specify the exact form of the relationship in terms of concrete figures (parameters), *i.e.*, to find the unique values of the P and Q matrices for China.

Pulling down the abstract field theory to a practically applicable model, however, required some preliminary work bridging the theory to world reality. First of all we needed to find empirically relevant meanings for P and Q within the context of field theory, since none were specified.

A nation's variation in foreign behavior can be analytically decomposed into two portions: one, universal behavioral patterns common across all nations; two, patterns attributable to that particular nation's idiosyncratic characteristics. To know the particular patterns, we must find the common universal patterns of

nations first, because the uniqueness of a nation's behavior is recognizable only when the universal patterns are understood.[8]

Common behavioral patterns have their origins in the fundamental characteristics of a nation. To explain this form of behavior, therefore, we may ignore the nation's unique attributes. This pattern is just a reflection of the laws which govern all nations' behavior. For example, we can say that Nepal will not attack China militarily within the next few years. Our knowledge of the weak military capability of Nepal leads us to this judgment. This means that we implicitly apply a basic law that large discrepancies in military capability discourage a weak nation from initiating military attacks against a strong one. This law is believed to be valid for any pair of nations of the world regardless of the characteristics of the nations involved. If we could have a set of universal laws which govern the basic behavior of nations, then we could explain a great portion of the behavioral variations in nations.

Particular patterns of a nation's behavior can be viewed as deviations from the universal ones. This means that the universal behavioral pattern is modified by a nation's idiosyncratic decision-making system. For example, each nation has her own perceptual framework, and when she makes her foreign policy decision, this specific framework may emphasize a certain factor among various components which compose her decision-making environment. For instance,

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[8]See A. Kaplan, 1964, p. 117. He stated, "differences are understood and explained only by reference somewhere to similarities: how we conceive of an individual is the product of generalizations."

we can say that it is probable that Egypt will cooperate with Syria in a certain common-market-type economic organization, but no one will think of a similar cooperative effort between Israel and Egypt. Why? We know that mutual economic necessity and geographic proximity as well as historical amity induce economic cooperation between nations (let us suppose that it is a universal law). In the case of Israel and Egypt, Israel probably has a unique perceptual framework which puts special emphasis on their religious-cultural differences (the historical antagonism factor) and, as a consequence, this unique decision-making pattern makes her behavior an exception to the universal law of proximity and mutual necessity in her economic cooperative behavior.

In this vein, we can say that in order to understand a nation's foreign behavior patterns, first we need to uncover the basic laws of behavior of all nations in general that underlie those patterns. Then, with the knowledge of these laws, we can proceed to delineate a particular nation's specific patterns of foreign behavior.

With this bifurcation of a nation's variation of behavior in mind, let us have a closer look at Rummel's field theory.

Rummel's social field theory, based on a field concept of world reality,[9] defines the forms of relationship between the behavior of a nation and her environmental conditions in rigorous mathematical functions, stating that, "[a nation's] behavior [toward another nation]

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[9]In Chapter 3, this will be discussed in detail.

is the consequence of the total social situation, and this situation forms a field consisting of social characteristics, or attributes. Behavior is relative ... to the relative similarities and differences of nations on their attributes ... behavior is a linear function of the relative location of the two [interacting nations] in the system of attributes ...."[10] More simply, "the behavior of one nation toward another is a linear transformation of their differences from each other on their attributes."[11] As a whole, this provides us with one basic universal law applicable to all nations.

As mentioned above, in order to understand China's unique patterns of foreign behavior, we need to know both the universal theory (a set of laws) underlying that behavior and the unique decision-making system idiosyncratic to China which modifies the universal laws. Since Rummel's social field theory tells us the basic relations between China's behavior and her attribute distances, what remains to be done is to define the specific decisional framework which would cause China to deviate from the universal behavior patterns of nations.

Within field theory, the weighting parameters, P and Q, in the equation may be interpreted as the actor's perceptual and behavioral framework, respectively. In reality, we can see that the same attribute distance is perceived differently by the decision-makers of different nations depending upon their personal experiences, belief

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[10]Rummel, 1965, p. 183.

[11]Rummel, 1969c, p. 2.

system, educational background, political value orientation, etc. For example, India may perceive religious distance from other nations to be more significant than does China who pays little attention to them. And even if they perceive attribute distances in the same way, the various decision-makers may respond differently according to their unique behavioral framework (or decision criteria). China, for instance, will probably adopt economic aid instead of military maneuvers in solving border disputes with small nations like Burma, if China's leadership has a special preference for non-violent solutions, even though the military solution may be more expedient. In this case, China has a unique pattern of behavioral choice which constitutes a particular behavioral framework. In this sense, I will call this model the "double subjective modification system" of a nation's foreign behavior. In brief, we can formulate an empirically applicable model for a nation's foreign behavior by inserting actual figures for P and Q which represent the nation's unique decisional framework. Methodologically, then, the second aim of this research was to determine the stable values of these two parameters of Rummel's model by its application to empirically collected data on China.

1.2 The Organization of This Paper

This paper is organized as follows. In Chapter II, past studies about Communist China's foreign behavior are examined with special emphasis on theories that have been applied to explain Chinese foreign behavior. In Chapter III, the model to be applied--Rummel's social field theory Model II--is presented and discussed in detail. The

discussion focuses on clarifying the meaning of the fundamental equation of the theory. The differences between the multiple regression model and the canonical regression model is especially scrutinized. In Chapter IV, the research design is presented, and variables and data used for this study are discussed in Chapter V.

From Chapter VI to Chapter X, the results of the analyses are given. In Chapter VI and VII, the basis dimensions of Attribute space and Behavior space are presented, respectively, and in Chapter VIII the results of testing field theory are given. In Chapter IX, China's foreign behavior patterns are discussed, and five different behavior patterns are illustrated in each of five sections; and in the sixth section, findings about China's foreign behavior patterns are summarized. In Chapter X, the results of testing the model's applicability are given. And, finally, we have the conclusion in Chapter XI.

In this study, data were collected on measures of attribute distances and China's behavior toward all nations for 1955 and 1963. Thirty-five variables for attribute distances and seventeen behavioral variables have been selected, most from the variable list used by the Dimensionality of Nations Project. Some variables, however, have been added to cope with China's unique perception and behavior, such as the percentage of overseas Chinese in the counterpart nation's population and Chinese attitude toward other nations reflected in the *Jen-min Jih-pao*. In this study all nations are included as objects of China's foreign behavior.

In order to make the points of the discussion and test results more comprehensible, virtually all of the test results are illustrated in twenty-seven tables and fifteen figures. In the appendix, raw data are presented to allow anyone to test the arguments I have made in this paper.

In order to make the test reliable, each step of the analysis was repeated four times; the first with the original data, the second with a reduced number of object nations, the third with the skewed variables transformed and the fourth with the reduced and transformed data matrices.

CHAPTER II

STUDIES ON COMMUNIST CHINA'S FOREIGN BEHAVIOR

In comparison with other areas of international relations, the study of China remains neglected and underdeveloped. Considering her extraordinary size and her potential role in the future course of history, we may say that the study of China has been "retarded" in development.[12] A simple check of the articles reported in several leading American professional journals manifests the symptoms of this retardation.

First, in quantity, the number of articles written about China's foreign behavior was extremely small compared to other fields and regions. For example, in *World Politics*, a quarterly journal of international relations in general, out of a total of 748 articles printed in the past twenty-one years (from Vol. 1 to Vol. 21), only five were related to China's foreign behavior (twenty-eight articles were about China). The *American Political Science Review* was more extreme. It allocated space for only one article about China's foreign behavior out of 774 articles contained in the last twenty volumes (eight articles were about China in general). The *Journal of Asian Studies* is an area-specific professional journal. Even this Asia-major journal has

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[12]The expression, "retarded," was used by Howard Boorman. See Boorman, 1960.

devoted less than one percent of its space to the study of Chinese foreign behavior.

Secondly, even among the scarce studies of Communist China's foreign behavior, most were purely descriptive works. Of the nine articles reported in the four journals above (a total of seventy-three volumes), only two can be regarded as theoretical attempts to explain or predict China's foreign behavior patterns.[13] These facts imply that either there have been relatively few publishable works on China's foreign behavior, or most American political scientists were not interested in the topic.

Johnson has captured well the current 'state of the art': "social science analysis has neither staged a 'take-off', nor begun 'the drive to maturity' ... in fact, in my opinion social science has yet to achieve 'the preconditions for take-off' from which it can begin to theorize about China "[14]

The theoretical retardation of China studies can be illustrated in a number of ways. For example, we have studies of Communist China's military policy based on general Communist foreign policy objectives without any agreement on what those objectives actually are (*e.g.*, Bobrow, 1964). Or without examining the fundamental relationship

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[13]These two are Smoker (1969) and Bobrow (1964). Note that this number refers only to the four journals examined. Recently, more books and articles have been published. For example, in 1967 alone, 17 books and 331 articles were reported in the *Bibliography of Asian Studies*. This is a worldwide publication list.

[14]Johnson, 1965, p. 256.

between the basic ecological situation of a nation and a nation's behavior, some have tried to explain China's foreign behavior based only upon the top decision-makers' ideological attributes (Tang Tsou, 1965). As discussed above, a top decision-maker's political orientation and/or *Weltanschauung* may formulate a unique perceptual or behavioral framework which modifies the basic laws governing the relationship between nations, but it alone cannot be a sufficient explanatory factor of a nation's foreign behavior. In fact, we may say that Mao's revolutionary strategy itself was a reflection of his perception of the ecological situation of Communist China in the past.

Many reasons for this retardation have been given. For example, Dorrill gave the following: 1) lack of available data, 2) inaccessibility to China (both physically and through the communication media), 3) language gap, and 4) a socio-politico system different from the Western world (Dorrill, 1964). But the basic reason is more likely the paucity of theoretical models applicable to the study of a nation's external behavior in general.[15]

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[15]For a taxonomic inventory of the theories in international relations, see Phillips (1969). If we classify existing theories by the analytical tools employed, we have the following seven kinds (some examples are given in parentheses): 1) descriptive statistics (Singer and Small, 1966; McClelland, 1967; North, Holsti and Brody, 1967), 2) inferential statistics (Brody, 1963; Haas, 1965; Zinnes, 1967), 3) probability theory (Richardson, 1960a; Horvath, 1963, 1967), 4) calculus (Richardson, 1960b), 5) topology (Lewin, 1951; this is a psychological work, but general enough to be applied in international relations), 6) linear algebra-graph theory (Harary, 1961; Brams, 1968), 7) linear algebra-factor analysis (Cattell, 1949; Alker, 1964; Rummel, 1965; Gregg and Banks, 1965; Tanter, 1966; Russett, 1967; Denton and Phillips, 1968).

This lack of theories, however, is not unique to the study of international relations. It is, to some extent, a common problem of the social sciences in general.

One of the functions of theory in the study of international relations, as in any field in the social sciences, is the organizing function (McClelland, 1966, p. 15, and Deutsch, 1966, p. 8). This means, as McClelland stated, that "theory orients knowledge by furnishing the means to put the pieces together." According to Thompson, "theory gives order and meaning to a mass of phenomena without which it would remain disconnected and unintelligible" (Thompson, 1955, p. 735). Without theory, therefore, a mere description of a situation is difficult, since we cannot decide which data are most worth getting.

Social reality is too complex to be described in full detail in all its aspects. This means that selection is of the essence. Theory "establishes relative priorities for further inquiries by establishing the criteria of significance" (McClelland, 1966, p. 15). Theory guides us as to what to look at, and what to describe. Therefore, theory is essential even in the description of a situation or a phenomenon.

For explanation of a certain behavior, theory is even more essential. To explain, in a broad sense, means to "make something intelligible or comprehensible" and "the aim of explanation is the reconciliation with our intellectual desires of the perceptions forced on us by the external world of nature" (A. Kaplan, 1964, p. 33). Then what is the actual process of explanation? Hempel and Oppenheim described it in the following way: "an event is explained

by subsuming it under general laws, *i.e.*, by showing that it occurred in accordance with those laws, by virtue of the realization of certain antecedent conditions ... the explanation of a general regularity consists in subsuming it under another, more comprehensive regularity, under a more general law."[16] Therefore, explaining a nation's behavior means to discover laws governing recurring regularities in observable behavior. And a theory, which includes empirically testable statements of lawlike generalizations,[17] can serve as a guide in seeking the underlying laws of behavior.

For a prediction, the function of a theory is the same as for an explanation, since "the logical structure of scientific explanation is identical with that of a scientific prediction, the only difference between them being the purely pragmatic one of the temporal vantage point of inquirer."[18] In the case of an explanation, we are seeking the conditions and a lawlike statement for the existing event; while in prediction we seek an event on the bases of existing conditions and a known lawlike statement. Since the theoretical structure of an

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[16]Hempel and Oppenheim, 1968, ch. 15.

[17]Rudner (1966, p. 10): "A theory is a systematically related set of statements, including some lawlike generalizations, that is empirically testable."

[18]Rudner, *ibid.*, p. 60. He viewed the structure of explanation as the following: "The formal structure of a scientific explanation of some specific event has three parts: first, a statement E describing the specific event to be explained; second, a set of statements C_1 to C_n describing specific relevant circumstances that are antecedent to, or otherwise causally correlated with the event described by E; third, a set of lawlike statements L_1 to L_n, universal generalizations whose import is roughly, 'Whenever events of the kind described by C_1 through C_n take place, then an event of the kind described by E takes place.'"

explanation and a prediction are identical, "we have an explanation for an event if, and only if, we could have predicted it."

If we can agree that the final goal of academic enterprise in international relations, as well as in other fields, is to understand and explain (thus predict) empirical phenomena or events occurring within the system concerned (Deutsch, 1968, p. 7), then a theory about the pattern of behavior to be studied must be formulated first. Then we can collect data (where the theory provides the selection criteria), and with the data, test the validity of the theory. If the theory is inadequate, it must be revised. We should then, as Deutsch stated, "re-examine concepts, methods, and interest and should search for new symbolic models (theories) and/or new strategies in selecting the major targets for the next attack" (Deutsch, 1963, pp. 3-4). Then with the revised theory, we should again repeat the above stages.

If we view the process of social science research in this way, what stage has the study of Communist China reached at present? Johnson aptly answered this question, "much of the work already done on Chinese communism has been in the nature of intelligence-collecting rather than social science research. This is neither surprising nor bad in itself, but intelligence compilation is not social science. (The major potential contribution of social science is its capacity to provide for systemic thinking about the nature of Chinese Communist society and politics.)"

"Without the systematic application of social science theory to Chinese data, intelligence will provide only the most superficial aids to understanding China ... we must have theory-specific studies of

Chinese politics (behavior) in order to use even the data that we now possess and in order to generate newer and better theories" (Johnson, 1965, p. 258).

Let us examine briefly an inventory of past China studies. In the first section, non-theoretical descriptive studies will be examined and in the latter section, some theory-oriented studies will be discussed.

2.1 Non-theoretical Studies on Communist China's Foreign Behavior

Among the scarce studies which dealt with China's foreign behavior, most were non-theoretical and dealt with China's relations with particular nations. Levi's "Nepal in World Politics" (1957), Hinton's *China's Relations with Burma and Vietnam* (1968), Fairbank's *The United States and China* (1958), Leng's *Japan and Communist China* (1958), and North's *Moscow and Chinese Communists* (1953) are some examples.

Though the main sources adopted for explanation differed among each of the studies (domestic condition, historical relations, China's traditional expansionism, etc.), one common thread appeared throughout: the emphasis was on the unique context within which China and a particular nations ought to behave. These kinds of studies are very helpful for grasping the uniqueness of the relations between that particular pair of nations. But, considering that uniqueness can be understood only when the common patterns are recognized by adopting some theoretical model, a mere description of interactions between the

two nations (China and her counterpart) does not provide us with a comprehensive picture of the situation.

Even though few in number, there are some fine general discussions of Communist China's foreign behavior as a whole. Barnett's *Communist China and Asia* (1960), Hinton's *Communist China in World Politics* (1966), Hsieh's *Communist China's Strategy in the Nuclear Era* (1962), and Levi's *Modern China's Foreign Policy* (1953) are examples.

One obvious characteristic about the above studies is that they did not formulate or apply any "theory" explicitly and consistently. This lack of theory made the generalizability of their findings significantly limited, and the abundant information they gathered could not contribute directly to succeeding research.

Hinton, for example, clearly stated his antagonism against theory saying that "I proceed on the basis of no general theory or political action: I find most such theories vague and pretentious ... Nor do I employ any unique or complex method based on some such general point of departure. I prefer history ... If there is a master key, it is context and educated intuition" (1966, preface viii, underlining added).

One common characteristic of the explanatory scheme of these non-theoretical, general studies was that common sense and human intuition served as the foundation of understanding. They all described in full detail the contextual situation under which Communist China decides her foreign behavior, by using such historically well known concepts as motivation, national goal, ideology and national

power as a working framework. Then implicitly relying on the reader's intuitive logic, they tried to connect the contextual situation and China's decisions. In a rough sense, therefore, they also use a crude form of theory about human behavior (*e.g.*, under a specific circumstance, all men are expected to behave in such ways," etc.), while expressedly denying them.

Hinton, for example, denied theories. Nevertheless, his suggested five "roots of Communist China's foreign policy" (the traditional superiority complex, historical anti-Western attitude, backwardness in economic and social development, ideological and political support from the Soviet Union and Maoism ideology[19]), with which he explained China's foreign policy,were all based on social scientific theories (*e.g.* psychological attitude theory, economic theory, linkage theory,[20] etc.); though these theories were not explicitly referred to, they were assumed implicitly.

In general, the problems of non-theoretical studies can be summarized in two points. First, without theoretical construction, the generalizability of the explanation is reduced. Without a bridge of common theory, we cannot apply the findings generated from one

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[19]Hinton, 1966, Part One, section 1, pp. 3-22.

[20]A linkage theory is a theory that postulates the form of the relationship between domestic political process of a nation and her outside environmental or political phenomena. Since the time when Rosenau suggested the necessity of developing linkage theories in 1966, there have been several attempts to develop theories within the conceptual framework of the linkage idea, but not rigorous theory has yet been developed. For the conceptual framework, see Rosenau, 1969, Chapter 3, and for the examples of theorizing attempts, see Chapters 4-12.

study to another. Furthermore, without theory, we cannot compare the the results of one study with those of other similar studies, since we do not have any common frame.

Second, without theory, we cannot "explain" and "predict" behavior scientifically, since the logical structure of explanation presupposes a theory. Besides theory, we have some other explanatory schemes like the metaphor and the analogy. Metaphors, for example, are important aids for explanation, since they may make the reader have the experience of "understanding." But a "metaphorical model cannot be expected to yield logically compelling theorems which are translatable into prediction."[21]

2.2 Theoretical Studies on Communist China's Foreign Behavior

Recently (since 1960), theoretical studies about China's foreign behavior began to appear either as a part of a global study, or as an independent one. But again most deal with China's behavior toward one or a few particular nations. Zagoria (1962), Greaser (1966), Bobrow (1965), McClelland, *et al.* (1967), Sullivan (1964), Zaninovich (1964), Smoker (1969) are some examples.

Although limited in both scope and the number of nations involved, their contribution to the knowledge of China's foreign behavior is significant. For example, McClelland's study (McClelland, *et al.*, 1967) was limited geographically (Quemoy and Tachen Islands),

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[21]Rapoport, 1958, p. 51.

in time (1950-1964), and in the number of nations involved (Communist China, Nationalist China, U.S.A. and U.S.S.R.). The type of behavior was also restricted to political-military action in regard to limited confrontations. With these restrictions, however, they determined some basic patterns of Communist China's crises and non-crises behavior in general with consistency and repetition of behavioral forms over time (p. 3). Thus this finding could serve as a model for dealing with China's behavior under similar conditions.

Sullivan's (1964) study was similar to McClelland's. Starting his research with a general hypothesis that "certain types of societies will tend to routinize their behavior after a crisis and a relationship of stability will be restored," he tried to discover the interaction patterns of China *vis-à-vis* other nations and the changes in these patterns during and after crises periods. Again, with this kind of theoretical approach, Sullivan contributes knowledge which can be applied to other studies.

Zaninovich's study of the Sino-Soviet dispute was to analyze the interaction patterns of the two nations applying the "mediated stimulus-response model," a kind of behavioral model of the relationship between behavioral stimulus and perceptual response. Again, this research, though it deals with only one dyadic relation, could contribute to the knowledge of China's interaction pattern (or of any nation's pattern), because the theory tested was general and applicable to any pair of nations.

Bobrow's studies were especially highly sophisticated and innovative. His basic theoretical stance on a nation's international behavior has been that international behavior is the product of an interaction between action and situation attributes. (This is inferred from his four articles: 1964, 1965, 1967, 1969b). From this basic notion he tried to establish a working model that would depict China's own behavioral system in response to the situation she encounters.

In "Chinese Communist Response to Alternative U.S. Active and Passive Defense Postures" (1965), Bobrow, guided by a further assumption that "the Chinese act on the basis of what they believe to be reality" (p. 2) tried to build a psychological theory applicable to China's responsive pattern to changing American policy toward her. Thus, he contributed significantly to the advancement of analytic studies of Chinese foreign policy, though he dealt with only particular dyad, *i.e.*, China *vs.* U.S.A.

There have been very few theoretical works which explain the overall pattern of Communist China's foreign behavior. Among China's foreign behavior literature, the single title which fell into this category was Bobrow's "Ecology of International Games: Requirement for a Model of the International System" (1969). What Bobrow attempted was to build a new theoretical model of a nation's overall behavior pattern, and to test the model with China data. After examining all current theoretical approaches, namely, the system, actor and situation approaches, Bobrow argued that we must incorporate the powerful contributions of all three. He further suggested the new models have to be ones of the interaction of actor games and encountered situa-

tions, and finally formulated a theoretical model called "a game ecology-situation module."

With this theory, he experimented with observed data to discover the "ecology of international games in which Communist China is engaged" (p. 14). Methodologically, he factor analyzed China's action data to delineate the "structure of China's action space" and then searched for the extent of association between these activity factors and the universe of political actors. He, however, did not theorize the association. He simply tried to discover empirically regular patterns of association between the actor factors and the types of ecology. In this sense, his study may be regarded as a precursor of theoretical research on China's foreign behavior, but not as a real theoretical study itself.

There were some studies based on some pre-theories, however. By "pre-theory," I mean a conceptual framework which includes one or more lawlike generalizations, but without any specified relationship among variables. "Pre-theoretical" studies are different from non-theoretical studies, since they are guided by an explicitly adopted "theory."[22] However, they differ from the rigorous theoretical

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[22]When I listed some non-theoretical studies, I mentioned that we could find some underlying pre-theories. But in their case, theories were not explicitly nor consistently adopted by the authors. In the pre-theoretical studies, however, theories were explicitly and consistently referred to.

studies, since their "theories" lack certain essential qualities.[23]

In this group of studies, I put Halperin and Perkins (1965), North (1969), Scalapino (1963), and an earlier work of Bobrow (1964). Halperin and Perkins (1965), for example, used a "theory" based on the concepts of "national interest" and "ideology." To infer Chinese national interest and ideology, they manipulated a selected array of variables, "relevant political, ideological, economic, technological, military and cultural factors, as well as predisposing historical and traditional influences,"[24] though the variables were not fully clarified in the main text.

Among all the studies in this group, North's (1969) is most prominent. In his introduction to *The Foreign Relations of China*, an undergraduate textbook, North clarified his theoretical perspective. Starting with assumptions of multicausality, he suggested three basic explanatory concepts with which a nation's foreign behavior is analyzed: capability, political leadership, and political culture and institution. Then, he intended to "show, insofar as possible, how they [the concepts] related to each other and how they combine to account for extensive aspects of Communist China's international activities" (pp. 2-3). Especially in the discus-

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[23]To be a theory, a conceptual framework should have at least one lawlike, generalizable statement constructed in terms of concepts which are measurable and empirically testable. See Rudner, 1966, p. 10; A. Kaplan, 1964, pp. 294-8; and McClelland, 1966, pp. 6-16.

[24]See Lindbeck's foreword of the book.

sion of the dynamic aspects of a nation's foreign behavior, he tried to apply basic notions of status theory (disparity of actual power status and desired status) and of the power transition theory (the relations between new challenging power and the old powers). As a whole, his thinking provided us with an invaluable theoretical framework for foreign behavior study, although he did not propose a rigorous theory.

Bobrow's study on China's military foreign behavior (Bobrow, 1964) is also a good example. To set forth the "calculus or rationale which Peking employs to select military strategy and tactics," Bobrow employed a well-known traditional conceptual framework composed of such concepts as national goal, domestic requirements, etc. Under the assumption that "Peking's leaders adopt what they believe to be the best available military policy to cope with what they perceive to be challenges of foreign opponents, to attain their foreign ambitions, and to satisfy domestic political and economic needs,"[25] Bobrow tried to analyze four components of China's military calculus: expectations regarding the United States, foreign goals, domestic requirements, and interpretations of previous military experience.

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[25]Notice that this assumption, itself, is a kind of theory, a mixture of a stimulus-response type interaction theory and a theory based on rationalism.

From the brief review above, we may conclude that "social science has yet to achieve the preconditions for take-off from which it can begin to theorize about China."[26] To proceed, therefore, we must have more theory-specific studies of China's foreign behavior. As discussed before, studies without theories have only limited utility to describe the present and predict the future nature of Chinese behavior and its determinant. Some "fundamental restructuring and innovation in our tools of concept and method are required to improve our description and predictive capabilities."[27]

Then, practically, what should be done? Bobrow suggested the following:[28] "Wise selection of nations trait variables and careful collection of information about China and other nations for those variables [should be carried out] to increase our ability to 1) measure the extent and direction of differences between national traits at different times; 2) establish empirically the extent to which China tends to cluster near to (be similar to) or far from (be different from) other nations; 3) assess the descriptive utility of alternative conceptual typologies and the limits of their applicability; 4) test hypotheses about the statistical co-occurrence of particular traits of nations; 5) determine the nature of the relationship between national traits (input variables to national élite

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[26]Johnson, *op. cit.*, p. 256.

[27]Bobrow, 1967, p. 306.

[28]Bobrow, *Ibid.*, p. 309.

decisions); and national policies (output variables form national élite decisions); and 6) on the basis of analyses of this fifth type select hypotheses about the reasons for policy choices."

I can agree with all these suggestions. What I intended to do in this research was to theorize China's foreign behavior and to select basic indicator variables with which we can explain and predict such behavior. My grand design has been to provide a stepping stone between the present "pre-conditions for take-off" and the future "take-off" stage in studies of China's foreign behavior.

CHAPTER III

RUMMEL'S SOCIAL FIELD THEORY: THE MODEL TO BE APPLIED

Philosophically, Rummel's social field theory is based on the concept of the world as a field. Rummel views social reality as "a field consisting of the attributes of social units and their interactions. Attributes are those characteristics by which a social unit can be differentiated from all other social units. The behavior that social units direct toward each other are their interactions (Rummel, 1968a, p. 26)."

Theoretically, Rummel's social field theory is rigorously structured. Based on seven well formulated axioms, it postulates a law which defines the form of interrelationship between the behavior of a social unit and the relative attribute differences of that social unit from others. The heart of the theory is the basic mathematical equation representing the model of the relations defined by the above law. The analytic system employed is linear algebra, and many constructs in the theory are expressed in terms of linear algebraic concepts.

In the first section of this chapter (3.1), the conception of social reality that underlies field theory will be discussed briefly in conjunction with some other basic world views. In section 3.2, I shall discuss the concept of a "field," the core concept of field theory, reviewing its various applications in order to exemplify the philosophical background of the theory. In section 3.3, the theoret-

ical structure of Rummel's field theory will be elaborated on. Then, in section 3.4, the basic equation of the theory will be presented.

3.1 The World Conception of Field Theory

Social laws are universal generalizations of relationships between two or more phenomena.[29] Therefore, social laws cannot be empirically "discovered," since empirical observations cannot exhaust all possible relationships and a universal generalization, therefore, is impossible. Also, a mere summarization of observational findings does not provide the logical nexus among phenomena.[30] Laws must be "formulated." "Guided by his knowledge of observational data, the scientist has to invent a set of concepts--theoretical constructs (which will provide the necessary logical nexus between phenomena)."[31] In this sense, laws are products of the scientist's intuition and, as a result, there are no absolute laws. Laws remain as laws insofar as they serve to explain observable phenomena. Therefore, laws are,

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[29]A formal definition of social laws may be given as "statements or equations that will explain or state the form of a relationship between terms in the analytic system." A. Kaplan distinguishes laws from other scientific statements, calling laws "truly universal nomological generalizations, unrestricted as to space and time." (A. Kaplan, 1964, p. 91).

[30]See Hempel, 1952, p. 19. See also Popper, 1968, p. 27. " ... it is far from obvious, from a logical point of view, that we are justified in inferring universal statements from singular ones, no matter how numerous; for any conclusions drawn in this way may always turn out to be false: no matter how many instances of white swans we may have observed, this does not justify the conclusions that all swans are white."

[31]*loc. cit.*

inevitably, reflections of the scientist's conception of social reality.

Historically, the reality[32] of international relations has been understood in many different ways. For example, ancient Confucianists in China believed that there exists a perfect universal order (*tien-li*, *i.e.*, Heaven's will), and actual politics (both domestic and international) are the processes of the realization of that order.[33] Later in Western society, Hegel took a similar position about the reality of international relations. He believed that "reason is the substance of the universe ... the design of the world is absolute rational."[34] Hegel thought change and motion (which are supposed to have a predetermined pattern) as the only reality and tried to "identify this reality with the historical process of continuous building and becoming."[35]

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[32]For the usage of the term, "reality," see Wright, 1955, p. 11. He states that "I believe it [reality] is commonly used by scientists, to designate existence in time and space apart from any observer, assuming without argument that time and space are characteristics of a world which exists apart from the observer."

[33]See Lee, 1966, pp. 341-60. The Confucianist concept of the world was well illustrated in *The Chung-yung*, one of the *Four Great Books*.

[34]Hegel, *Philosophy of History*, Bohn (ed.), pp. 9-13, quoted in Durant, 1953, p. 224.

[35]Wright, 1955, p. 10.

If we conceive of world reality as a planned process[36] as the Confucianists and Hegel, we need not pay great attention to the outside environment of a nation in order to explain and predict its foreign behavior. We need to study history (Hegel) or natural laws through introspection (Confucianists) to identify the "inevitable progress" of civilization to explain changes in a nation's foreign behavior as well as other social and political changes.

Currently for Morgenthau, reality in international relations is "power politics," which "is governed by objective laws that have their roots in human nature (unchangeable), ... statesmen think and act in terms of interest defined as power."[37]

He assumed that, first, states are entitled to exist, and, second, to preserve their independent identities, states can rely only upon power to avoid conquest by their neighbors. Consequently, the struggle of each to be more powerful than any probable enemy is natural. To Morgenthau, the reality of international relations is the struggle of nations for power, and the mechanics of social equilibrium is the core concept describing the process of this struggling reality.[38] Thus, Morgenthau's belief in power politics is based on

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[36]Wright classified world views into five kinds; the world as a plan, the world as an equilibrium, the world as an organization, the world as a community, and the world as a field. According to this classification, the above examples of Hegel and the Confucianists belong to 'the world as a plan,' while Morgenthau's (see next paragraph) belongs to 'the world as an equilibrium.' For further discussion, see Wright, *ibid.*, pp. 485 and 488.

[37]Morgenthau, 1966, pp. 4-5.

[38]See Morgenthau, *ibid.*, pp. 162-163.

his concept of the world as an equilibrium, and to him international relations is a simple mechanical system, changing along with the varying power distribution on each side of the antagonistic groups to maintain the balance of power.[39] To him, therefore, "calculations of the aggressive and resisting power of each and the distances and barriers which separated them might sufficiently determine the stability of the system ... and social, moral, and ideological factors might be safely disregarded."[40]

Departing from these simple mechanistic views of reality in international relations, Wright tried to view the world as "a field of conditions, values, ideals, and attitudes, in contiguous flux ... exerting influence upon the actions of individuals, associations, and nations."[41] According to him, the behavior of human beings is conditional on their environmental situation, and discovering the forms of relations between specific patterns of environmental conditions and patterns of the actor's behavior is essential in order to explain and predict the behavior.

Rummel's field theory is based on such a view of world reality. Behavior is believed to be the consequence of the total social

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[39]*Loc. cit.*

[40]Wright, 1955, p. 488.

[41]Wright, *ibid.*, p. 499.

situation which forms a field consisting of social characteristics, or attributes.[42] The above is consonant with my concept of a nation as an organic system composed of systematically related roles played by human beings, where its foreign behavior is the reflection of the decisions made by the top decision-makers of the nation system. And I think that it is likely that there are laws that specify the forms of relationship between patterns of decisions (therefore, the behavior) and the patterns of environmental conditions including the personal psychology of decision-makers, the nation's attributes, and the relative similarities and differences with the other nations. It is this similarity in world view that made me choose Rummel's field theory as the guiding theory of this study.

3.2 Concept of a Field

The concept of a field is not new. The notion has existed since the time of Euclid.[43] What is new to us, however, is its application in modern science.

3.2.1 The Field Concept in Physics

Even though the notion of a field has been an age-old concept in physics, it was only when Maxwell first introduced it by formulating the law of electromagnetism in the 19th century, that the concept

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[42]Rummel, 1965, p. 183.

[43]For various applications of the field concept in history, see Wright, 1955, pp. 524-8.

began to play a great role in various theories.[44]

In Newton's mechanics, a system is completely described when the location of the constituent mass points are known as functions of time. But in Maxwell's field theory, "the field variables are defined for all values both of the time coordinate and of the three space coordinates, and are thus functions of four independent variables."[45] More important with Maxwell's field theory, however, is the notion of field strength or intensity. That is, the force acting upon a mass point is determined by the field in the immediate neighborhood of the mass point, and conversely, the presence of the mass point may and usually does modify the field. In other words, a field of force whose "attribute ... at any point is measured by the force which the field exerts upon a unit mass placed at that point."[46] was conceived. It was the very idea of a relationship between the attribute of the point and the force exerted at the point that was adopted by social scientists to explain social phenomena.

In general, a field is defined as "a region of space in which a given effect (as gravity, magnetism ...) exists and has a definite value at each point."[47] Modeled after that, social scientists defined a field as "a complex of coexisting forces (as biological, psychological and social or interpersonal) which serve as causative agents

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[44]Bergman, 1942, p. 16.

[45]Bergman, *Ibid.*, p. 17.

[46]Webster's *Third New International Dictionary*, 1969. For a mathematical definition of "field," see Yilmaz, 1965, pp. 62-3.

[47]*Loc. cit.*

or as a frame of reference in human experience and behavior."[48]

Another influence of physical field theory on the social sciences is the concept of distances. "In Newtonian mechanics, the idea of position or location seems to be fundamental. From it we derive distance or extension as a subsidiary notion. Position is looked upon as a physical fact--as an identifiable point of space--whereas distance is looked upon as an abstraction or a computational result calculated when the positions are known. Field theory reverses this view. Distance (extension, interval) is now fundamental; the location of an object is a computational result summarizing the physical fact that it is at certain intervals from the other objects in the world .... In brief, space is not a lot of points close together; it is a lot of distances interlocked."[49] This idea is directly reflected in Galtung (1964) and Rummel (1965).

The third idea similar to physical field theory is the coordinate system in social field theory. As we have seen above, field in physics is defined by a time-space four dimensional coordinate system. Wright's field theory started with the introduction of the coordinate system (See 3.2.3).

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[48]*Loc. cit.*

[49]Eddington, 1957, pp. 9-10.

3.2.2 Lewin's Field Concept

The most comprehensive among earlier attempts to utilize the concept of field in social science studies was Lewin's (1964).[50] To cope with a multitude of factors influencing an event, he used the "construct" field. He conceived of all behavior as "a change of some state of a field in a given unit of time (dx/dt)." In treating individual psychology, the field is the "life space" which consists of the person and the psychological environment as it exists for him.[51] In dealing with group psychology or sociology, a similar formulation was proposed. Lewin viewed that the social happening occurs in, and is the result of, "a totality of coexisting social entities, such as groups, subgroups, members, barriers, channels of communication, etc."[52] He also viewed that the relative position of the entities (within the field) represents the structure of the group and its ecological setting and that this relative position expresses also the basic possibilities of locomotion within the field."[53]

To summarize, his "construct" of behavior is viewed as a function of life space: $B = f(P,E) = f(LSp)$, and explaining behavior (B) then is identical with 1) finding a scientific representation of the

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[50]Since this is a collection of ten different works by Lewin, the exact year cannot be given here. 1964 is the year of publication of the book which includes papers published between 1940 and 1947.

[51]Lewin, 1964, p. xi.

[52]*Ibid.*, p. 200.

[53]Lewin, 1964, *loc. cit.*

life space (LSp) and 2) determining the function *(f)* which links behavior to the life space.[54] But Lewin did not formulate the function. He only suggested the broad relationship between a unit's behavior and its setting, but neither mathematized the structure of his "theory," nor his deduction. Therefore, his construct remained short of a theory.[55]

3.2.3 Wright's Field Concept

Wright (1955) defined a field as "a system defined by time and space or by analytical coordinates, and by the properties, relations, and movements of the entities within it."[56] He believed that every situation can be conceived as a field by postulating suitable coordinates. Then he argued that a "description of the field provides a basis for explaining the past and in a measure predicting the future of the entities (within the field)."[57] On the basis of these postulates, he presented a verbally structured field theory applied to international relations.

Wright suggested two different types of fields, geographic and analytic. The former "locates the people and groups of the world and their characteristics, motivations, actions, institutions, and

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[54] *Ibid.*, p. 240. B = behavior, P = person, E = environment, LSp = life space and *f* = "function of."

[55] For theoretical comment on his theory, see Rummel, 1968a, p. 23, note 10.

[56] Wright, 1955, p. 524.

[57] *Loc. cit.*

conditions in actual time and space."[58] And the latter implies that "each international organization, national government, association, individual, or other 'system of action,' or decision-maker may be located in a multi-dimensional field which is defined by coordinates, each of which measures a political, economic, psychological, sociological, ethical, or other continuum influencing choices, decisions, and actions important for international relations."[59]

Then observing movements of the entities across time within the field, and analyzing relative distances among entities, he tried to link behavior to its setting defined by the given situational dimensions.

Compared to Lewin's field theory, Wright's has some advantages since its coordinate system and vector notions give it potential for developing equations relating behavior to structural dimensions. But Wright himself did not formulate any generalizable lawlike statement concerning the relationships, nor did he provide any tool to define inter-relations among the dimensions of the field. In brief, his ideas were not integrated into a rigorous theory.

3.2.4 Rummel's Field Concept

Ten years after Wright's verbal formulation of the concept of a "field," Rummel systematized a "social field theory" using a linear algebraic model (Rummel, 1965).

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[58] Wright, 1955, p. 540.

[59] *Ibid.*, p. 543.

The basic philosophy of Rummel's social field theory, as I have quoted elsewhere, is that "behavior is the consequence of the total social situation, and this situation forms a field consisting of social characteristics, or attributes, which stand in definite relation to each other (Rummel, 1968a)."

One notable departure of Rummel's concept from Wright's and others' is the structure of the field. Wright, for example, considered the Cartesian coordinate system for the structure of the fields he conceived. Since Cartesian space has orthogonally-fixed coordinates, and Wright assigns each of the attribute dimensions to each of these coordinate axes, we cannot express the relationship among the attribute dimensions in this space. But Rummel's field is a vector space where the attribute distances and nation's behavior are represented by vectors which can denote both the magnitude (in terms of length of the vector), and interrelationships among various attribute dimensions and behavior (in terms of the angle between vectors).

Rummel "analytically divides social reality into two vector spaces. One space is that of attributes of social units, and the other is that of behavior between social units. Within attribute space, each social unit is located as a vector in terms of its attributes. Within the behavior space, every pair of social units, called a dyad, is located as a vector in accordance with the interaction of the two members (Rummel, 1968a, p. 24)."

A basic characteristic of Rummel's concept which sets it apart from Wright's is the notion of distances. Wright also considered

various attribute distances (geographical, psychological, technical) as acting as forces influencing international relations (Wright, 1955, p. 297). In his field structure, however, the individual nation's attribute vector (the location of a nation in the field and the magnitude of the variance of the attributable variable) are regarded as fundamental and the distances (differences) are looked upon as a subsidiary notion or as a computational result calculated from known positions of the nations.[60]

But in Rummel's field, distance is regarded as fundamental. A justification for preference of distance to magnitude was given by Rummel, drawing on an analogy with small group behavior: "The total behavior of an individual in a social group is highly related to his personality characteristics. Place an individual in different groups and his behavior will shift as a function of his personality differences with members of the group. That is, relative distances on personality dimensions between individuals influence behavior more than the actual characteristics themselves. Likewise, for nations it is social, economic, political, and geographic distances that influence international behavior. Differences in technological levels, values, power, and perception of the international order relate to the 'moves' that nations direct toward each other (Rummel, 1968c, p. 214)." In

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[60]For example, he considered, "the relations of friendliness or hostility of two systems of action can be indicated by the direction of their vectors toward or away from one another in the value field." (Wright, 1955, p. 545). He did not directly utilize the distance vector as a force in determining relations.

this sense, Rummel's field concept is more similar to the original concept of a field in physics rather than to other field concepts.

As we have seen, the basic philosophy of Rummel's field theory overlaps partly with Lewin's and Wright's. Indeed, there is little that is new about Rummel's field theory in its components. What is new is that "it integrates an orientation toward social reality and research with mathematics and some social propositions in a different way. The theory represents a reorientation toward social action, a different point of view." (Rummel, 1968a, p. 24) Being well integrated into a rigorous scientific theory, once the truth of the lawlike statement of the theory is validated by empirical testing, then the whole theory will serve as a useful general explanatory model about social behavior applicable to international relations,[61] *i.e.*, as "a framework within which deduction about social action and international relations may be made."[62] This is the merit of Rummel's social field theory.

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[61]Field Theory is a general theory applicable to all kinds of social units. If we define social reality as international relations and social units as nations, then it serves as an international relations theory, and "we can represent international relations within the analytic structure of field theory and then describe the linkage between a nation and its attributes by the theory (Rummel, 1969b, p. 10)."

[62]Rummel, 1968a, p. 24.

3.3 The Structure of Rummel's Social Field Theory: Seven Axioms

Rummel's social field theory (hereafter, it will be referred to as simply field theory) is based on several assumptions: 1) that a nation's attributes and behaviors coexist in a field and that the whole field is relevant to understanding the specific behavior; 2) that the past is presumed to operate through behaviors and attributes currently coexisting in the field; and 3) that absolute magnitudes of behaviors and attributes are considered irrelevant; what is relevant is the relative behavior between nations and their attributes relative to each other (Rummel, 1969c).

These assumptions of field theory are mathematically structured in the following way.

1) The international field of attributes and behaviors is divided into two infinite vector spaces, one of behaviors and the other of attributes.

2) In attribute space, nations are projected as vectors according to their standardized attributes scores, and in behavior spaces, nations are coupled into nation dyads by the behavior of one nation to another, and all possible dyads are projected into this space as vectors.

3) The linkage between the two spaces is postulated as a linear dependence of a dyad's position in behavior space on the distance vectors between the nations in attribute space. These distance vectors are then conceived of as social forces affecting international behavior.

Formally, field theory consists of seven axioms, describing social reality and functionally relating the behavior of social units to their attributes. The seven axioms are:[63]

Axiom 1. International relations is a field consisting of all the attributes and their complex interrelationships.

Axiom 2. The international field can be analytically divided into attribute, A, and behavioral, B, spaces into which attributes and interactions are projected, respectively, as vectors.

Axiom 3. The attribute and behavioral spaces are generated by a finite set of linearly independent dimensions.

Axiom 4. Nations are located as vectors in attribute space and coupled into dyads in behavior space.

Axiom 5. The distance vectors in A-space that connect nations are social forces determining the location of dyads in B-space.

Axiom 6. The direction and velocity of movement over time of a dyad in B-space is along the resolution vector of the forces, d.

Axiom 7. B-space is a subspace of A-space.

Axiom 1 is a definitional statement. It says that the field consists of all the attributes and interactions of nations and their complex interrelationships. Here the attributes are not properties of the nations, but the quantities that define positions of the elements in the field *vis-à-vis* other nations. Any descriptive concept which can differentiate the position of a nation within the field from

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[63]The mathematical structure of the seven axioms of field theory is given in Rummel, 1965, Appendix I.

other nations can be an attribute variable. These may be such distinctions as size, shape, income, education, race, values or geographic locations (Rummel, 1968a, p. 16). Therefore, they may be infinite in number.

Interactions of nations are defined as behavior acts; any action of one nation toward a specific other nation. This action then couples the two nations together. Two nations so coupled by the actions of one are called a dyad and the action involved is dyadic behavior.

Attributes and behaviors are all in one space and they are all inter-related in a complex way. An attribute is not only related to other attributes but also to behavior. The focus of field theory is to find specifically the relations between attributes and behavior among other relations. Axiom 2 is postulated to separate all these complex interrelationships into these two groups. The separation is purely for the purpose of the theory. The second part of the axiom is designed to connect the reality of international relations with an analytic system, linear algebra. No longer simply a tool for analysis, linear algebra is an intrinsic part of the theory itself, and any deduction possible within it is allowable in this theory.

As stated above, the spaces defined by Axioms 1 and 2 could be infinite in their dimensions. To make the space finite, so that we can handle it, we need Axiom 3 which implies that if a behavior is

dependent on any set of attributes, then it will be dependent on a basis[64] (which is finite) of A-space.

Axiom 4 defines the constructs of A- and B-spaces. By Axiom 2, the field is separated into two analytic spaces, in which attributes and interactions are represented as vectors. By the fourth axiom, we also represent nations and nation dyads as vectors. Since the same nations are plotted in the two spaces (in A-space, as a separate entity; in B-space, as dyads), this provides us with an important bridge to connect the two spaces.

Axiom 5 is the core of the field theory. It relates attribute space to behavior space. The axiom is not an analytic, nor a definitional statement, but an empirical one which is falsifiable. This axiom makes the whole theory a testable one.

The relationship between A- and B-spaces defined by Axiom 5 is static. To give a dynamic interpretation to this, we need Axiom 6 which stipulates, 1) that the position of any dyad in B-space shifts according to the changes in the forces of A-space (this implies that the origin in B-space is the stable equilibrium of all the social forces), 2) that the changes occur along the resolution vector of the forces, d. This axiom is also non-analytic, whose truth can be verified by an empirical test. This proposed study, however, will deal only with the static relations postulated in Axiom 5.

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[64] A basis is a set of vectors which span the space. Therefore, any linear transformation of a basis is also a basis of the space, since it also spans the space. The dimensionality of a basis is unique, but the basis itself is not unique. For further detailed discussion, see Rummel, 1970a, pp. 66-71.

Finally, Axiom 7 tells us that B-space is completely contained in A-space and a basis of B-space is a linear combination of a basis of A. This axiom is not based on philosophical grounds but on a technical necessity. It provides a favorable condition under which we can connect the two spaces mathematically (see the next section). On the other hand, it may reduce the generalizability of the whole theory. If we can innovate the necessary mathematical manipulations this axiom can be deleted.

3.4 The Model of Field Theory

A theory is one of many possible interpretations of a calculus.[65] In field theory, the calculus is the analytic system composed of the seven axioms described above. When we interpret one or more lawlike statements of the analytic system, within the context of the system, such that the interpreted relation can be tested empirically, we have a theory. By employing a different semantic rule, we can interpret the same calculus in different ways, and thus establish another theory. So far as we do not violate any part of the contents of the axioms, all interpretations are isomorphic to each other. Therefore, even though they are different models, they are still the same theory.

The lawlike statement which is empirically falsifiable, in field theory, is the fifth axiom: the distance vectors in attribute space that connect nations are social forces determining the location of

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[65]"A model for a theory consists of an alternative interpretation of the same calculus of which the theory itself is an interpretation (Rudner, 1966, p. 24)."

dyads in behavior space. Depending upon how we operationalise the attribute distances and how we relate these distance vectors to the location of dyads in behavior space, we have different models of field theory.

3.4.1 The Basic Equation

The fundamental linkage between behavior and attributes proposed by Rummel, is

$$w_{i\to j,k} = \sum_{\ell=1}^{p} \alpha_\ell d_{i\to j,\ell} \qquad (1)$$

where $w_{i\to j,k}$ is the k-th dimension of B-space and i→j is a particular dyad, nation i as the actor and nation j as the object. The term $d_{i\to j,\ell}$ is one of the elements of the distance vector between nations i and j on the ℓ-th dimension in A-space and α_ℓ is a weighting scalar parameter on that dimension.

1) The term $d_{i\to j,\ell}$ is the distance vector from nation i to j on the ℓ-th attribute dimension. If we define nation i's value on the ℓ-th coordinate as $a_{i,\ell}$ and nation j's value as $a_{j,\ell}$, then,

$$d_{i\to j,\ell} = a_{j,\ell} - a_{i,\ell} \qquad (2)$$

For example, China's GNP in 1962 was 42 billion U.S. dollars, while Japan's was 77 billion.[66] In this case, the distance from China to

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[66]Eckstein, 1966, p. 249, Table 7-1.

Japan on the GNP dimension is calculated as

$$d_{\text{China}\rightarrow\text{Japan},\ \text{GNP}} = 77 - 42 = 35 \text{ (billion dollars)}^{67}$$

In a similar fashion, we can calculate the distance from China to Japan on other attribute dimensions; population distance = -484 million, steel production distance = 17 million tons,[68] and so on. Field theory axiomizes that each of these distances are the components of the force vector that makes a nation behave in a certain way.

2) Next, the term α_ℓ is the weighting parameter of each attribute dimension. Each attribute distance may have a different impact on the decision-makers of different nations. For example, the Chinese may be very concerned about their economic distance from other nations, while regarding the religious distances (differences) as trivial. Each α_ℓ is the specific scalar weight for each of the different attribute distances.

3) The symbol Σ denotes that we need to sum all attribute distances (differently weighted) in order to calculate the resultant force which is exerted on the nation to determine her behavior.

4) Finally, the term $w_{i\rightarrow j,k}$ represents one of the elements of the vector of nation i's behavior to j on the k-th behavioral dimension in B-space In field theory, as we discussed above, the unit of

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[67] In actual research, both A- and B-spaces are factor analyzed, first. The factor scores are, then, used as the values of each unit on factor dimensions. Therefore, d, the distance between $a_{i,\ell}$ and $a_{j,\ell}$ measures the differences in factor scores. The "raw differences" are given here to clarify the concept of distance.

[68] Both figures are from the UN Statistical Yearbook, 1965.

nation behavior is defined as a dyad, a pair of nations, one of which directs her behavior toward another (with our notation i•j, the nation i is the actor, and j is the receiver). For example, the fact that China gave 50 million dollars of economic aid to North Korea (1955) is expressed as

$$W_{\text{China•N. Korea, economic aid}} = 50 \text{ million dollars}$$

Equation (1) given above is in scalar form. That means we take one general element from the left side and one from the right side and express the relationship between them, or in other words, the equation denotes only one dyadic relationship. If we express equation (1) in matrix (vector) form, *i.e.* for all m dyads, it becomes

$$W^k_{mxl} = D_{mxp} P_{pxl} \tag{3}$$

where W^k_{mxl} is the k-th dimensional behavior vector of B-space which is composed of the same behavior of all m dyads; D_{mxp} is the matrix of the distance vectors, each column of which represents an attribute distance vector for m dyads; and P_{pxl} is a set of p weighting parameters each of which correspond to an attribute vector.

The expanded form of this matrix equation is,

$$W^k_{mx1} \qquad D_{mxp} \qquad P_{px1}$$

$$\begin{bmatrix} w_{i+1,k} \\ w_{i+2,k} \\ \vdots \\ w_{i+j,k} \\ \vdots \\ w_{i+m,k} \end{bmatrix} = \begin{bmatrix} d_{i+1,1} & \cdots & d_{i+1,\ell} & \cdots & d_{i+1,p} \\ d_{i+2,1} & \cdots & & & \vdots \\ \vdots & & & & \vdots \\ d_{i+j,1} & \cdots & d_{i+j,\ell} & \cdots & \vdots \\ \vdots & & \vdots & & \vdots \\ d_{i+m,1} & & d_{i+m,\ell} & & d_{i+m,p} \end{bmatrix} \begin{bmatrix} a_1 \\ a_2 \\ \vdots \\ a_\ell \\ \vdots \\ a_p \end{bmatrix} \tag{4}$$

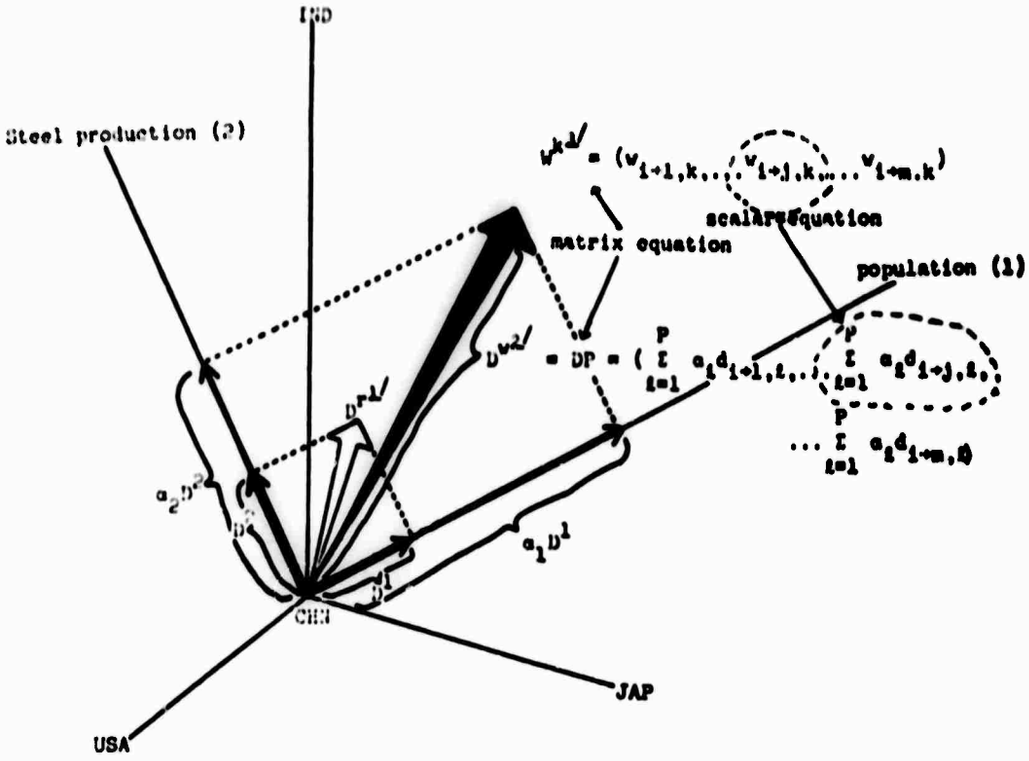
$$D^1 \qquad D^\ell \qquad D^p$$

$$= a_1 \begin{bmatrix} d_{i+1,1} \\ d_{i+2,1} \\ \vdots \\ d_{i+j,1} \\ \vdots \\ d_{i+m,1} \end{bmatrix} + \cdots a_\ell \begin{bmatrix} d_{i+1,\ell} \\ d_{i+2,\ell} \\ \vdots \\ d_{i+j,\ell} \\ \vdots \\ d_{i+m,\ell} \end{bmatrix} + \cdots + a_p \begin{bmatrix} d_{i+1,p} \\ d_{i+2,p} \\ \vdots \\ d_{i+j,p} \\ \vdots \\ d_{i+m,p} \end{bmatrix}$$

where D^ℓ is the ℓ-th column vector of D. If we define D^W as the weighted resolution vector of D^ℓ vectors where each D^ℓ vector is weighted by corresponding a_ℓ weights, then,

$$W^k = D^W = \sum_{\ell=1}^{p} a_\ell D^\ell \tag{5}$$

Geometrically, the basic equation of the field theory can be illustrated as in Figure 1. Here, the location of China's position is



1/ D^r = resolution vector of D^t

2/ D^w = resolution vector of weighted D^t $(a_t D^t)$.

$D^w = DP = a_1 D^1 + a_2 D^2 + \ldots + a_t D^t + \ldots + a_p D^p$

Therefore, the first term of D^w is $a_1 d_{i\to1,1} + a_2 d_{i\to1,2} \ldots + a_t d_{k\to1,t} + \ldots + a_p d_{i\to1,p} = \sum_{t=1}^{p} a_t d_{i\to1,}$ and the j-th term is $\sum_{t=1}^{p} a_t d_{i\to j,t}$

3/ W^k = k-th vector of W. The j-th element of W^k is $w_{i\to j,k}$.

FIGURE 1

GEOMETRIC EXPRESSION OF THE BASIC EQUATION
OF FIELD THEORY

taken as the origin of the coordinates. (In general, any point in attribute space may be chosen as the origin. The relative distances among all nation points are not affected by choice of origin.) There are q dimensional vectors in W and each of them are related to D^W in the form of equation (5). If we express all the equations as a single equation, we would have

$$W_{mxq} = D_{mxp} P_{pxq} \tag{6}$$

where W^k_{mxl} is one of the column vectors (k-th vector) of W_{mxq}.

3.4.2 Field Theory Model I and Model II

There are two different models developed by Rummel according to the different interpretations for weighting the parameters. In Model I, the parameters are universal, *i.e.*, the same across all the actors. This implies that the unique experiences and capacities of each nation and the structures within them are irrelevant to her behavior. In other words, a nation's responses to the various kinds of distances are the same as all other nations. Furthermore, it implies that the behavior of nation i to j is the exact opposite of the behavior of nation j to i. This obviously contradicts common sense.[69]

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[69]"Recall that a distance vector for nations i and j is a difference. Thus, when we reverse i and j we only reverse the sign on the distance vector. Then, the behavior of i to j will only differ from j to i in the sign, and not the absolute value (Rummel, 1969b, p. 18)."

In Model II, the parameters are unique to each actor nation. This model allows the impact of each of the attribute distances on behavior to differ according to each nation. This is the point where each nation's intelligence can be geared in. Thus, for example, although China's attribute distances from other nations are the same as India's, the impact of these distances on her foreign policy will differ from India's, due to her unique perceptual framework. For this reason, Model II is preferable to Model I. In Model II, the equation that links behavior and attribute difference is,

$$w_{i\to j,k} = \sum_{\ell=1}^{p} \alpha_{i\ell}\, d_{i\to j,\ell} \qquad (7)$$

Here, $\alpha_{i\ell}$ has replaced α_{ℓ} in the equation of Model I, equation (2).

In matrix form, the equation is

$$W^{k}_{mxl} = D_{mxp}\, P^{i}_{pxl} \qquad (8)$$

and for all q behavioral vectors together,

$$W_{mxq} = D_{mxp}\, P^{i}_{pxq} \qquad (9)$$

where P^{i}_{pxl} and P^{i}_{pxq} are unique weighting parameters which represent each nation's idiosyncratic decision-making system. For convenience the superscript i will be dropped, since this study will deal with only one actor, China, P_{pxq} can denote P^{China}_{pxq} without any confusion.

Then, the complete model with error matrix U inserted will look like

$$W_{mxq} = D_{mxp} P_{pxq} + U_{mxq} \qquad (10)$$

Hereafter, when I refer to field theory, it will be Model II, if not specified otherwise.

3.4.3 The Multiple Regression Model and the Canonical Regression Model

Now let us turn our attention to the behavior vector in B-space which is supposed to be related to the resolution vector of the individually weighted attribute distance vectors of A-space (D^W).

Axiom 5 states that "the distance vectors in A-space that connect nations are social forces determining the location of dyads in B-space." Mathematically this axiom tells us only that distance vectors in A-space are functionally related to the behavioral vectors in B-space, but does not specify how these two kinds of vectors (or the two spaces) are related. How this is done, therefore, depends upon our intuitive interpretation of the nexus under the guidance of the overall philosophy of field theory. Among many possible interpretations, I will discuss two; Rummel's original formulation and an alternative.

Rummel's original formulation was given above in equations (7) and (8). This relates the resolution vector of attribute distances (D^W) to the k-th dimensional vector of B-space (W^k). In this formulation, the same matrix D^W weighted with different sets of weighting parameters, P^1, P^2, ... P^k, ... P^q is linked to each of the behavioral vectors in B-space respectively, namely, W^1, W^2, ... W^k, ... W^q. The model, however, has nothing to do with the interrelationship among the

behavioral vectors. Equation (10), $W_{mxq} = D_{mxp} P_{pxq} + U_{mxq}$, is therefore, a mere aggregation of q separate vector equations (multiple regression equations).

Theoretically, this formulation would tell us that a particular behavior (*e.g.* negative communication) is explained by a certain subset of attribute distances (*e.g.* GNP, political distances, etc.), while another behavior (*e.g.* economic aid) is mainly explained by another set of distances (*e.g.* number of Communist party members, steel production, etc.) without specifying the interrelationships between these individual behaviors (*e.g.* negative communication and economic aid).[70]

In this model, the weighting parameters P may be understood as the actor's unique "decision-framework" which represents the combination of both the perceptual framework and the system of behavioral choice, since this is the only set of parameters by which the actor's idiosyncracy may be expressed.[71]

Geometrically, the relations between each of W^k and D^w may be illustrated as in Figure 2.

When we apply this model to an empirical study, we need to evaluate the P matrix of equation (10). Since this model requires an analysis of the relations among a single criterion measure (k-th

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[70]If we use the orthogonal basis dimensions rather than the raw behavioral vectors, this orthogonality gives meaningful interrelationships among these separate equations, *i.e.*, they are mutually independent. In this case, notice that the relationships are specified by the intrinsic characteristics of the basis, but not by the model.

[71]This distinguishes this model from the canonical model where perceptual and behavioral frameworks are separated and represented by different parameters. See Chapter 1 and the next part of this Chapter.

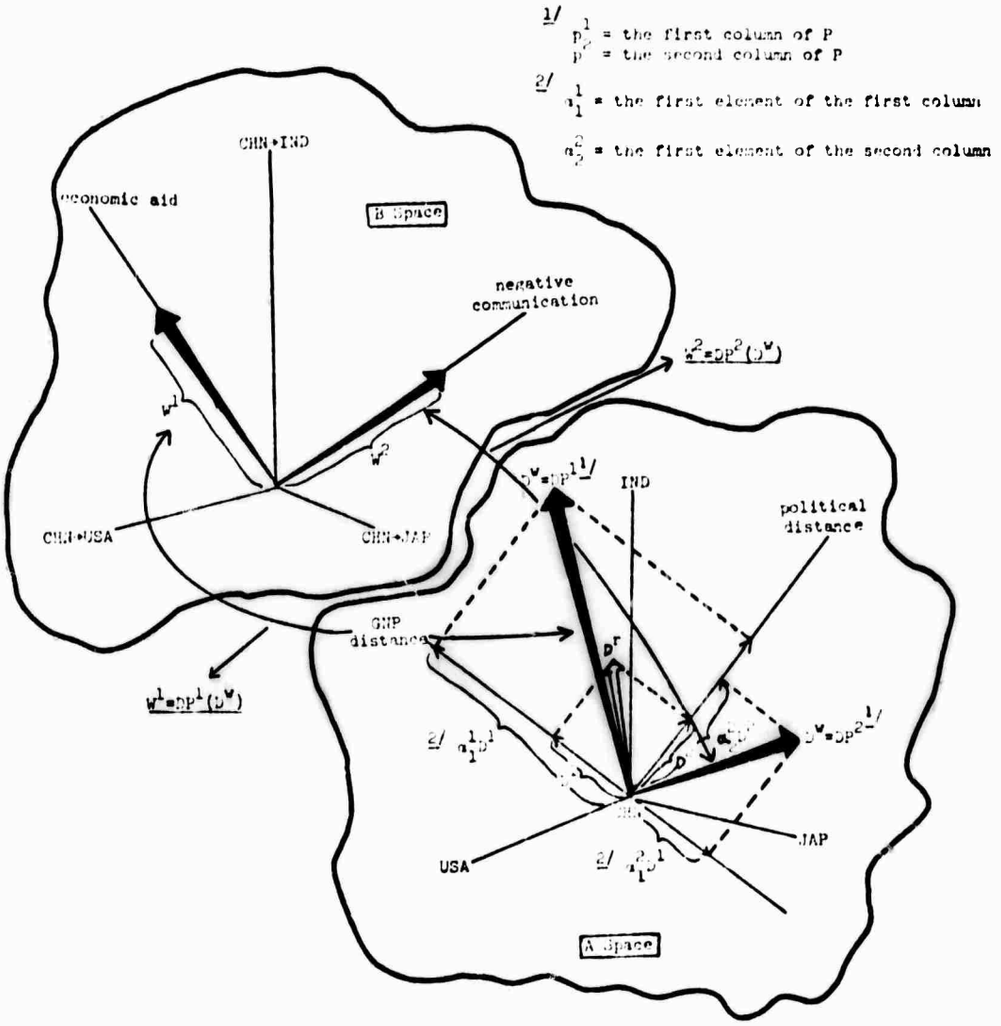

FIGURE 2

GEOMETRIC ILLUSTRATION OF MRM
(MULTIPLE REGRESSION MODEL) OF FIELD THEORY

behavioral vector) and two or more predictor measures (p attribute distance vectors), we can evaluate the values of P employing the least-squares estimation technique, a standard solution of a multiple regression model which assures us of finding the best unbiased estimate of W^k.[72] Hereafter, I will call this formulation (equation 10) the Multiple Regression Model of Field Theory (MRM).

Technically, however, this model (MRM) created a problem. In this study, I sought: first, to determine a set of attribute indicators that best account for China's foreign behavior, and second, to "assess the empirical fit of B-space to A-space."[73] The first goal could be achieved with the MRM, since the estimate of W by P which is evaluated through the least-squares technique is the best unbiased estimate of W.[74]

In assessing the maximum fit between A- and B-space, however, there was a problem. With the MRM, to judge the fit between the two spaces, we measure the proportion of variance in B-space accounted for by A-space. If q variables of W are mutually orthogonal, then the 'trace correlation squared'($\bar{r}^2$), which is the mean variance of q behavioral variables in W accounted for by corresponding q estimate of the variables ($\hat{W}^k$), can measure the fit, since $\bar{r}^2$ has the largest

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[72]For the conditions and mathematical derivations for the solution of the multiple regression model, see Johnston, 1963, pp. 108-115, and Cooley and Lohnes, 1962, pp. 31-35.

[73]These two goals are the same as Rummel's. See Rummel, 1969b, p. 22.

[74]If the m dyads are a random sample from a multinormal universe. Rummel, *loc. cit.*

value for orthogonal W when W^k is estimated through the least-squares method. The equation for $\overline{r}^2$ is

$$\overline{r}^2 = \frac{1}{q} \sum_{k=1}^{q} (\frac{1}{m} W^k \cdot \hat{W}^k)^2 \qquad (11)$$

or in general

$$\overline{r}^2 = \frac{1}{qm^2} tr\{(W'\hat{W})'W'\hat{W}\} \qquad (12)$$

where "tr" is the sign for summation of the diagonal elements of the matrix.

The problem was that empirically we could not expect the variables of W to be orthogonal, nor does field theory constrain them to be orthogonal; only linear independency is required. Therefore, the mean correlation squared of all multiple correlations between W^k and D^W may not be the largest possible trace correlations squared between A- and B-spaces.

If we are interested in assessing the maximum fit between two spaces and not in reproducing the best estimated value of individual behavior variables, then we can start the analysis with any of the orthogonal basis of W instead of the raw variables. For example, if we factor analyze the W space with the varimax rotation criterion, we can find a basis of W, whose dimensions are mutually orthogonal and whose trace correlation with D^W is the maximum when we regress each of the behavioral basis dimensions onto D^W individually. But in this case, there is another problem.

A basis is not unique. Theoretically, there may be an infinite number of bases of W, all of which have the same maximum trace correl-

ations with D^W, because we can rotate any basis of W by any linear transformation without altering its inner structure (inter-dimensional relationship). For different bases, however, the distribution and magnitude of correlations between each component behavior vector and D^W will vary from one basis to another. Therefore, we need one more restriction on the model which will determine the basis that would find the W^k which is best accounted for by the distances.

I solved this problem by making a simple modification of the interpretation of Axiom 5 in Rummel's original model. Instead of relating the W^k vector of B-space to D^W of A-space, I related W^W, the weighted resolution vector of q dimensions of W, to D^W. The scalar equation of the new model, then, is

$$\sum_{k=1}^{q} \beta_{ik} w_{i\to j,k} = \sum_{\ell=1}^{p} \alpha_{i\ell} d_{i\to j,\ell} \qquad (13)$$

where β_{ik} is the weighting parameter of the k-th behavioral dimension of W. In matrix form, the equation is

$$W_{mxq} Q_{qxl} = D_{mxp} P_{pxl} \qquad (14)$$

where Q_{qxl} is the matrix of β parameters for all q dimensions.

Technically, what I have done is to form a composite variate (V) out of p distance dimensions of D, weighting each p dimension by P, and another composite variate (Y) out of q dimensions of W, weighted by Q, and, then, relate these two composite variates. Geometrically, the relationship between the two variates is illustrated in Figure 3.

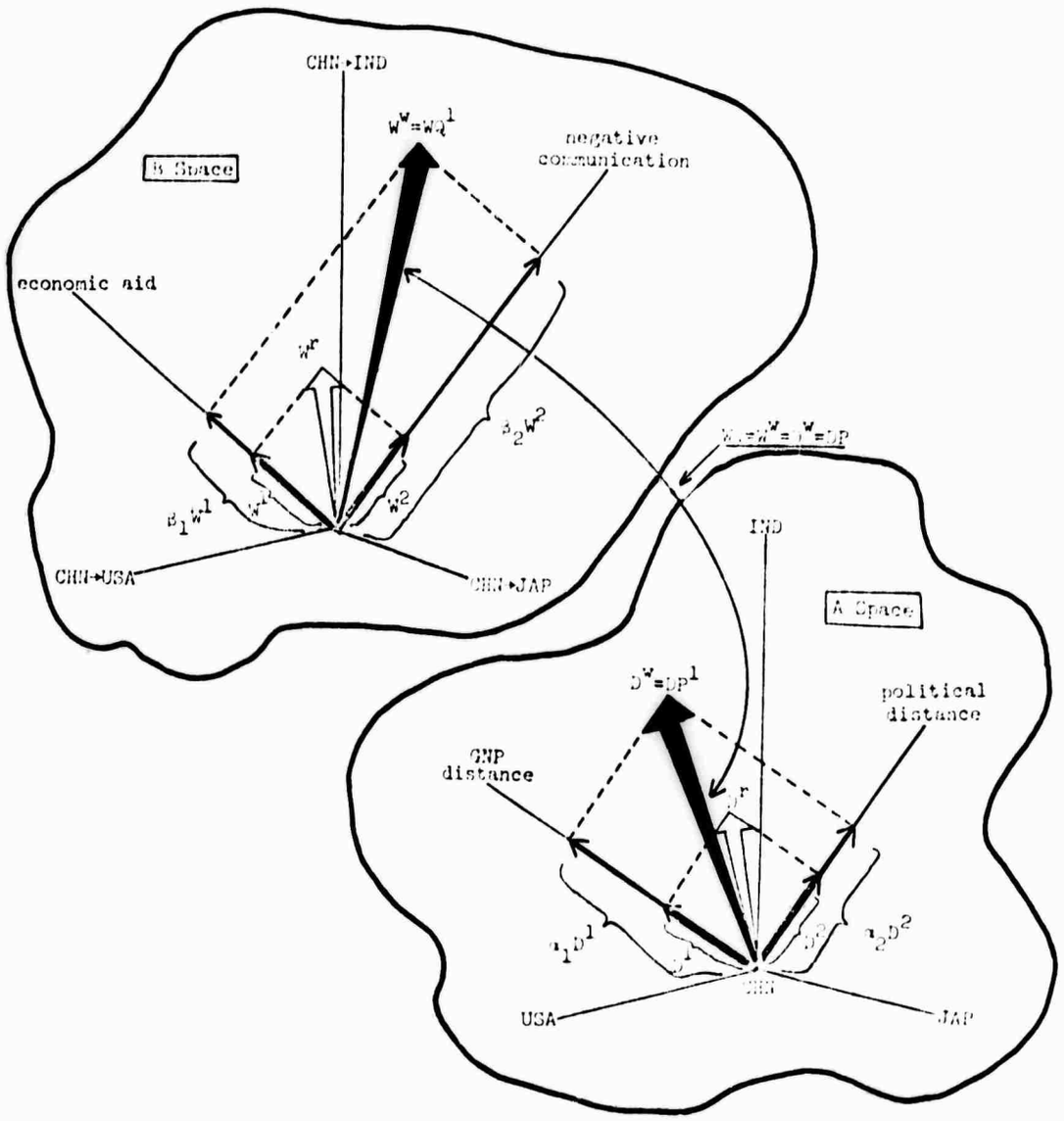

FIGURE 3

GEOMETRIC ILLUSTRATION OF CRM
(CANONICAL REGRESSION MODEL) OF FIELD THEORY

Theoretically, with this model, the parameters of P are the actor's unique perceptual framework of attribute distances,[75] which is formulated by her historical background, value system, cultural heritage, etc., and the parameters of Q the unique behavioral framework or system of behavioral choice which gives different emphasis on each behavior when given forces are applied.

To apply this model to China's behavior, we must evaluate both P and Q empirically, or solve Q and P of the following equation

$$WQ = DP + U \tag{15}$$

or

$$Y = V + U \tag{16}$$

where W and D are known, and U is the random error uncorrelated with any of the variables in D.

A solution is possible if we put the following restrictions on the equation[76]

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[75]Note that by "unique" perceptual (or behavioral) framework, it is not meant that an actor has only one universal screening framework for differentiating the relative potency among various distances. It means that an actor has a set of frameworks, each of which is for a particular behavior pattern. For example, to determine the intensity of negative communication toward an object nation, the actor may value the power distance most heavily, while for a trade behavior, it may show highest sensitivity to the distance in economic development. If we use canonical regression analysis to delineate these unique perceptual (and behavioral) frameworks, we shall have q sets of different unique perceptual frameworks, where q is the dimensionality of B-space.

[76]See Rummel, 1969b, p. 24.

$$Y'_h V_g = \text{maximum correlation when } h = g$$
$$Y'_h V_g = 0, \text{ when } h \neq g \qquad (17)$$
$$Y'_h Y_h = V'_h V_h = 1$$

The equation (15) with restrictions (17) is the canonical regression model[77] and we can solve for the best fitting Y and V from W and D employing canonical analysis. Then "V(=DP) will give the parameters of P best in the sense of minimizing U, and Y(=WQ) will give the behavior dimensions of B having the best correlations with attribute differences D."[78]

The canonical analysis gives us q different canonical equations,[79] each of which maximizes the correlation between the paired canonical variates (Y_h and V_g) under the restriction that each pair is orthogonal to all other pairs. In other words, the first canonical equation gives the highest possible correlation between the first composite score (variate) of distances (V_1) and the first composite variate of behavior (Y_1). The second equation gives the next composite variate of distances (V_2) and behavior (Y_2) which maximizes the correlations of the remainder of the total variances (the unexplained portion of the variances which is independent of those explained by the first

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[77]For the model of canonical regression and its mathematical derivations, see Hotelling, 1935, Hooper, 1959, Cooley and Lohnes, 1962, Anderson, 1958, and Glahn, 1969.

[78]Rummel, *op. cit.*, p. 24.

[79]The number of pairs of canonical variates which come out from a canonical analysis is q or p, whichever is the smaller. Axiom 7 tells us that $q \leq p$.

canonical equations) after the first equation had explained as much as possible, and so on for the third to q-th equations.

Then how can we fit this model to our reality? I interpreted the model in the following way: The whole decision space of the decision-makers, which includes both the inputs (targets of perception; here these are attribute distances between the decision-maker's nation and other nations) and outputs (decision result; behavior), may be decomposed into many subspaces or substructures of the decision process. For example, for military aid to other nations Chinese decision-makers would consider mainly economic distances and political systems rather than literacy rates, language difference, and catholic population. In determining behavior concerning student exchange, however, language difference, and technical distances may emerge as major considerations. Here we may say that the first pattern of relations is a political subset of the behavior structure while the latter constitutes a cultural subset.

Each substructure of the behavior pattern is represented by each of the canonical equations of the model. In this sense, equation (14) is one of the subsets of the whole model which contains q number of subsets. We, then, can express the general model of CRM in the following form,

$$W_{mxq}\ Q_{qxq} = D_{mxp}\ P_{pxq} + U_{mxq}. \qquad (18)$$

I called this new model the Canonical Regression Model (CRM) of field theory.[80]

As discussed above, the MRM has one decision framework and the CRM has two--perceptual framework and behavioral system--and this means that the decision framework in the MRM is decomposed into two separate systems in the CRM.

The CRM, however, has one theoretical disadvantage compared to the MRM. In evaluating Q and P, the solution under the standard restrictions of the canonical analysis maximizes only the correlation between the composite canonical variates of both W and D; each individual behavior variable is identifiable only as it contributes to the particular variate. Also, the solution does not assure us of finding the maximum correlation between individual behavior and distances. Therefore, the CRM is not an adequate model to be applied if we are interested in reproducing the raw values of each of the behavioral variables which has the maximum multiple correlations, with the set of distances.

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[80]Technically speaking, the MRM is a special case of the CRM where all B coefficients except for one, the k-th parameter B_{ℓ} are zeros. In other words, if we give another restriction, $B_{\ell} = 0$ if $k \neq$ number of the equation, and $B_{\ell} = 1$ if $k =$ number of the equation, then equation (13) will degenerate into

$$w_{i \cdot j,k} = \sum_{\ell=1}^{p} a_{\ell} d_{k \cdot j,\ell} ,$$

which is the multiple regression model. This is only true when W and D are orthogonal matrices. If we use factor scores (obtained from the orthogonal varimax rotation) instead of raw data, W and D are orthgonal.

Since I wished both to find China's unique system of perception of attribute distances and preference of behavior, and to predict the actual value of behavioral variables, I used both models. To delineate China's unique foreign policy structure (behavior pattern), the CRM was better than the MRM, while to calculate the best estimated real value of a specific behavior in the future, the MRM was better. A detailed strategy for the utilization of both models will be discussed in the next chapter.

3.4.4 Theoretical Implication of the Empirical Model

In order to develop an empirically applicable model for Communist China's foreign behavior, I interpreted the P and Q of field theory Model II as Chinese decision-makers unique perceptual and behavioral frameworks, respectively, which are invariant across time. Then, I designed the P and Q to be evaluated from the empirical data.

Thus, theoretically, what I have done is that to the analytic skeleton of field theory, flesh of substantive contents were given empirically. In field theory, the postulated form of the relationship between behavior (W) and attribute distances (D) is a linear function. The P and Q, then, are to be evaluated to maximize the linear fit between the two spaces.

As I mentioned earlier, however, the theory does not postulate the quantities of the P and Q substantively. These are left to be evaluated with empirical data. Therefore, the theory implies that the nature of linearity between A- and B-spaces is invariant over time, but it does not imply that the actual figures of the P and Q are also

invariant. In field theory, the P and Q may vary across time, because the D and W will change over time, and the parameters that maximize correlations of different data sets may be different.

By interpreting the P and Q as invariant systems of perception and behavior, however, I add one extra-model restriction on the nature of the P and Q (to be invariant across time). In this sense, the "interpretation" actually creates a sub-theory within the field theory framework by adding one more constraint on the nature of the P and Q.

CHAPTER IV

RESEARCH DESIGN

The goals of this study, as discussed in the introduction, were first, to test field theory with data for China's foreign behavior, and second, to uncover China's unique behavioral patterns by evaluating P and Q of the field theory Model II equation. The second goal can be fulfilled by obtaining equations that link foreign behavior patterns to attribute distances in ways unique to China. Then, this pattern relationship between behavior and distances can be used to predict the values of the behavioral variables for China in the future. What follows is the design I used to achieve these goals.

4.1 The Bases of A- and B-Spaces

Field theory is formulated in terms of the basis dimensions of A- and B-spaces (see 3.3 Axiom 3 in conjunction with Axiom 5). Furthermore, in this study, the models of China's behavioral pattern are formulated in the forms of canonical structure equations. Although the canonical regression model does not require orthogonality among variables, to eliminate the effect of interaction among the variables (basis dimensions) in canonical analysis the basis dimensions must be orthogonal, because intercorrelated variables will mix the contribution of each individual variable to the variate scores with the joint effect of the correlated variables. To meet these requirements, both A- and B-space data were factor analyzed employing the principal component

technique,[81] and orthogonally rotated with the varimax criterion.[82] The resultant orthogonal factors of the data matrices are the bases of the two spaces. The basis of B-space thus delineated is W and that of A-space D in the CRM (equation 18).[83]

4.2 Factor Comparison

If field theory is valid, the proposed linear linkage between A- and B-space bases should be unchanged across time. Thus, the theory was tested twice, first with 1955 data and then with 1963 data. Then, the results of both analyses were compared using various statistical techniques (see 4.3 and 4.4 below).

The comparison, however, requires the same (at least similar) structure for the spaces (both D and W) across the two time points, *i.e.*, D in 1955 and D in 1963 must have the same factors as does W. The requirement of identical factors across time is crucial in formulating an empirically applicable model for China's foreign behavior, with which the actual scores of future behavior variables are supposed to be forecast.

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[81]For definition and solution of the principal component analysis technique, see Rummel, *ibid.*, pp. 338-345 (4.3.4).

[82]Rummel, *ibid.*, pp. 391-393.

[83]Factor scores of the basis dimensions were used in the W and D matrices. For computation, "The Modular Factor Analysis Package," newly programmed by Charles Wall is used. This package is available at the Dimensionality of Nations Project, University of Hawaii.

In this study, the factors of 1955 space (both A- and B-) were compared to those of 1963 space with Ahmavaara's transformation technique.[84] To compare the factors of two matrices (D-1955 and D-1963; W-1955 and W-1963), first the loading matrices of the D-1963 and W-1963 ($\hat{F}_2$) were estimated from the factor loading matrices of the first analyses, D-1955 and W-1955 (F_1) employing the following formula:

$$\hat{F}_2 = F_1 L, \text{ where } L = \{(F_1' F_1)^{-1} F_1' F_2 \}.$$

The product-moment correlation between F_2 and $\hat{F}_2$ served as an indicator of similarity between the two spaces.[85] Also, correlations between each pair of corresponding factors in two time points were calculated to see individual similarities among variables.[86]

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[84]See Ahmavaara and Markkanen, 1958, pp. 80-83.

[85]The correlation is calculated between two super column vectors, produced by connecting all columns in the matrix one after another (the top of the second column is placed below the bottom of the first column, and so on). Computation was done with Wall's "Modular Factor Comparison Program," which is also available at the Dimensionality of Nations Project, University of Hawaii.

[86]The same computation program by Wall given in footnote 85 is used.

4.3 Multiple Regression Analysis

To test the MRM of field theory, each of the behavior vectors were regressed on all vectors of D. Then, the predicted value ($\hat{W} = DP$) was correlated with the observed value (W).[87] This correlation indicated the fit of the model to the data.

4.4 Canonical Regression Analysis

From the CRM model (equation 18), taking W to be dependent and D to be independent, a canonical regression analysis was performed. This analysis gave us two kinds of matrices.

The first matrix is the regression coefficients, the α's and β's of the CRM, which are the weighting parameters of each of the dimensional vectors which maximizes the canonical correlation between each pair of canonical variates (Y_1 and V_1, Y_2 and V_2, ... and so on).[88] These regression coefficients allow us to formulate q number of relational equations

$$\begin{aligned} &\beta_1 W^1 + \beta_2 W^2 + \ldots + \beta_k W^k + \ldots + \beta_q W^q \\ &= \alpha_1 D^1 + \alpha_2 D^2 + \ldots + \alpha_\ell D^\ell + \alpha_p D^p + e \end{aligned} \tag{19}$$

---

[87] The correlation between W and $\hat{W}$ is calculated as if all vectors in both matrices form one long column vector each, the first vector being connected to the top of the second vector, and so on. In this way we can get a single measurement of fit between the two matrices. For computation, the "Modular Factor Comparison Program" (footnote 85) is utilized.

[88] There will be q sets of canonical variates, where q is the dimensionality of W.

where e is random error. Each of these equations represents each sub-set of China's behavior pattern discussed in Chapter 3. Let us call this the canonical regression coefficient matrix (C_r).

Another matrix obtained from the canonical analysis is a canonical loading matrix, which contains correlations between the canonical variates and the original variables.[89] Therefore, each of the elements of this matrix, when squared, gave the proportion of variance in Y_h and V_g accounted for by the corresponding dimensions. Utilizing this knowledge of the contribution of individual dimensional variables in constituting canonical variates, we can see the pattern structure of China's behavior; which distances are related to which behavior. If we define the loadings of W^k on Y_h as b_{kh}, and the loadings of D^ℓ on V_g as $a_{\ell g}$, then we can construct the following structure equations,

$$\begin{aligned} & b_{1h}W^1 + g_{2h}W^2 + \ldots + b_{kh}W^k + \ldots + g_{qh}W^q \\ & \leftarrow a_{1g}D^1 + a_{2g}D^2 + \ldots + a_{\ell g}D^\ell + \ldots a_{pg}D^p \end{aligned} \qquad (20)$$

where g = h, and the arrow means "relatedness" between the two combinations. Each of these equations will tell us which attribute distances are important in explaining a specific combination of behaviors. Let

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[89] On the left hand side, the correlations are between W^k_h and Y_h, and on the right hand side, between D^ℓ_g and V_g, where W^k_h is the value of W^k in the h-th canonical equation, D^ℓ_g, the value of D^ℓ in g-th canonical equation.

us call this the canonical structure matrix (C_s). As we shall see later, both equations, (19) and (20), served to uncover the patterns of China's foreign behavior.

The following four statistics were utilized to measure the degree of fit between the model and data.

canonical correlation (r): This is the correlation between Y_h and V_g, where $h = g$. There is q number of canonical correlations, because in this study q, the dimensionality of B-space, is less than p, that of A-space. The canonical correlation, when squared, tells us the proportion of the total variance accounted for by the pattern, and will measure the salience of the pattern.

trace correlation squared ($\overline{r^2}$): The formula for calculating the trace correlation squared was given as equations (11) and (12). The $\overline{r^2}$ gives the proportion of overall variances in W accounted for by the model ($\hat{W} = DP$). To see the overall fit between A- and B-spaces, therefore, this statistic is an adequate measurement.

standard deviation of differences between estimated and observed behavior scores: The canonical variate is a hypothetical composite variable of all the dimensional vectors of distances and behavior, which are patterned by unique weighting parameters. If the patterns of behavior and of attribute distance vectors fit perfectly, the two canonical variates should be equal. This means that we can predict the behavior pattern perfectly from the pattern of attribute distances. Therefore, the magnitude of the differences between the two canonical variate scores--the actual canonical variate scores and those estimated

from the distance pattern--is a good indicator of the fit of the model. The standard deviation of the errors--the remainder after subtracting the estimated scores--can be used as a benchmark for the degree of fit of the model to the data.

communality estimate (H-SQ): In equation (20), if we square each of the loadings and sum them together for each side ($\sum_{k=1}^{q} b^2_k$ and $\sum_{\ell=1}^{p} a^2_\ell$), we will have another statistic called communality estimates. This statistic tells us the proportion of the variance in each variable contained in the pattern represented by equation (19). The sum of the squared communality over all factors in A-space, then, will tell us the proportion of variance in the space accounted for by the pattern.[90] If the H-SQ of distance in one pattern is low, this means little relation between the component variables and the pattern. If very high, it indicates that most of the variables are identified with the model. If we weight this H-SQ and corresponding H-SQ of B-space vectors (the same across all variates) by the ratio of numbers of vectors involved, then, we have the proportion of the total variance represented by equation (19). This statistic will, therefore, tell us the inner structures of the patterns, as well as the relative importance of the patterns in terms of the amount of variance accounted for.

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[90]The communality estimates (H-SQ) of behavioral vectors will always be 1.00, since B-space is smaller than A in dimensionality. Therefore, only the H-SQ of distances is meaningful for interpretation. See Phillips and Hall, 1968, p. 12.

4.5 Test of Applicability of the Models

If field theory is valid and the derived models can be applied to explain and predict Communist China's foreign behavior, then, we also should be able to forecast China's future behavior with the models.

The simplest test of the applicability of the models, therefore, is to compare the scores of each variable at some future time point forecast by the model with the observed scores. In this study, the tests were performed with the 1963 data in two different ways.

(1) Forecasting Values of Each Individual Behavior

In the first place, the scores of each individual behavioral factor of 1963 were forecast from the 1955 model. In the model, all dyadic behavior is measured in terms of the rotated factor scores of the basis dimension in B-space. In A-space, attribute distances are measured also in terms of factor score difference of the rotated basis dimensions of the space. Thus, what is forecast are the factor scores of each individual factor.

In this study both behavioral models (MRM and CRM) are built with the basic assumption that the decision framework of one nation will be unchanged over time. This means that the relative importance of the various attribute distances to the decision-maker's perception, as well as the preference pattern for the choice of foreign behavior by the decision-maker is invariant, though actual distances may change over time.

Thus, the test of the model is actually the test of the invariant nature of the perceptual and behavioral frameworks of the

decision-makers (in MRM, the two frameworks are geared into one decisional framework).

In this study, the test was performed with the 1963 data. First, P, the perceptual framework of Chinese decision-maker, and Q, the behavioral preference system (in MRM, P only) were calculated from the analyses of the 1955 data. Then, applying these P and Q of 1955 to D of 1963, the W of 1963 was calculated ($\hat{W}_{63}$). The comparison of the $\hat{W}_{63}$ to W_{63}, the observed scores, is a test of the applicability of the models.

The forecasting equation for the MRM is the same as the original MRM equation (equation 10) with exception of the P of 1963, which is replaced with the P of 1955.

For the CRM, however, Q on the left-hand side of the original model (equation 18) is moved to the right-hand side. The original model was

$$W_{mxq}\ Q_{qxq} = D_{mxp}\ P_{pxq} + U_{mxq} \qquad (18)$$

Post-multiplying both sides of the equation by Q'_{qxq},[91] we get

$$W_{mxq}\ Q_{qxq}\ Q'_{qxq} = D_{mxp}\ P_{pxq}\ Q'_{qxq} + U_{mxq}\ Q'_{qxq} \qquad (21)$$

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[91] In this study, the actual Q matrix was found to be a non-singular square matrix, and $\hat{W}$ was calculated by post-multiplying both sides by Q^{-1} directly. The equation was $W_{mxq} = D_{mxp}\ P_{pxq}\ Q^{-1}_{qxq}$

Post-multiplying both sides by $(Q_{qxq}\ Q'_{qxq})^{-1}$ again,

$$W_{mxq} = D_{mxp}\ P_{pxq}\ Q'_{qxq}\ (Q_{qxq}\ Q'_{qxq})^{-1} + U_{mxq}\ Q'_{qxq}\ (Q_{qxq}\ Q'_{qxq})^{-1} \quad (22)$$

If we replace P and Q of 1963 with those of 1955, then, our forecast W ($\hat{W}$) is

$$\hat{W}_{mxq} = D_{mxp}\ P_{pxq}\ Q'_{qxq}\ (Q_{qxq}\ Q'_{qxq})^{-1} \quad (23)$$

To measure the goodness of fit between W and $\hat{W}$ in both models, the product-moment correlations between each pair of corresponding vectors of W and $\hat{W}$ was calculated. The mean value of all correlations also was calculated to see the overall fit (trace correlation equivalent).

In this study, the overall fit of the forecast values ($\hat{W}_{63}$) from CRM must be equal to those from MRM, since we are using rotated basis dimensions produced with varimax rotation criteria, instead of raw variables.

The rotated basis dimensions are principal components of the space, and in MRM, we regressed each of these mutually orthogonal principal axes on the set of attribute distances. In CRM, through canonical regression procedure, we also rotated the factors of B-space to generate a set of orthogonal basis dimensions of the space (principal axes) which were projected into A-space such that each of the axes should have the maximum correlation with each of the rotated basis dimensions (principal axes) of A-space (the B-space basis dimensions projected into A-space are canonical variates of B-space, and

the corresponding A-space basis dimensions are those of A-space). Therefore, the only difference between the two models--MRM and CRM--was that, in MRM, the rotation of the B-space basis was done externally with separate factor rotation, while in CRM, the rotation was performed internally as a part of the canonical regression analysis. But if we had used intercorrelated raw behavior vectors, the results must have been different.

(2) Forecasting Pattern Scores

In CRM, the behavioral pattern comprises more than two behaviors in the form of a linear combination. The overall pattern scores, which are the weighted sum of the scores of the behaviors involved in the pattern, then, is the canonical variate scores.

For example, if a specific pattern of Chinese foreign behavior is found as .80 trade + .50 negative communication, and supposing that for a particular dyad, China→Japan, the factor scores of trade is 2.00 and, for negative communication the dyad has the value of 1.00, then the overall pattern score of this particular behavioral pattern for China→Japan will be .80 x 2.00 + .50 x 1.00 = 2.10.

The forecasting of this pattern score with CRM was done with 1963 data. First, the P was calculated from the analyses of the 1955 data (P_{55}) which then weighted the distances in 1963 (D_{63}). The results ($D_{63}P_{55}$), then were our forecast canonical variate scores, or the pattern scores of behavioral patterns in 1963 ($\hat{W}_{63}$). These scores were compared to the observed behavioral pattern scores (canonical variate scores) in 1963 (W_{63}) using the 1963 weights (Q_{63}).

Again product-moment correlations between each corresponding pair of canonical variate scores--forecast and observed--were calculated to measure the goodness of fit of the model to the data. The mean value of the squared correlations (trace-correlations) gave the overall fit.

CHAPTER V

VARIABLES AND DATA

5.1 The Population

In 1955, there were ninety-nine independent nations in the international system, and in 1963, there were one hundred and thirty-nine.[92] For this study, all smaller nations (population less than 500,000) and those which did not exist as independent nations at either time points have been deleted,[93] leaving eighty-two nations for which data were collected. These nations are listed in Table 1.

5.2 Variables

In this kind of study, there are no standard criteria for the inclusion or exclusion of variables. Practically, their selection is guided by research aims and relevant studies previously done on the subject. For instance, if we want to study the relationship between political stability and economic development in one nation, we need to select variables with which we can operationalize the two concepts, political stability and economic development. For political stability,

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[92]See *Information Please Almanac*: 1965, pp. 615-6.

[93]For a comprehensive list of national political units, see Russett-Singer-Small, 1969. The 500,000 population criterion for deleting smaller nations is arbitrary. For further discussion, see the comments of both Michael Haas and George Modelski, *et al.*, on the Russett-Singer-Small list, in the *American Political Science Review*, Vol. 62, No. 3, pp. 952-5.

TABLE 1

LIST OF NATIONS (N = 82)

I.D. NO.	NAME OF NATION	CODE	I.D. NO.	NAME OF NATION	CODE
1.	Afghanistan	AFG	42.	Italy	ITA
2.	Albania	ALB	43.	Japan	JAP
3.	Argentina	ARG	44.	Jordan	JOR
4.	Australia	AUL	45.	Korea (DPRK)	KON
5.	Austria	AUS	46.	Korea (ROK)	KOS
6.	Belgium	BEL	47.	Laos	LAO
7.	Bolivia	BOL	48.	Lebanon	LEB
8.	Brazil	BRA	49.	Liberia	LBR
9.	Bulgaria	BUL	50.	Libya	LBY
10.	Burma	BUR	51.	Mexico	MEX
11.	Cambodia	CAM	52.	Nepal	NEP
12.	Canada	CAN	53.	Netherlands	NTH
13.	Ceylon	CEY	54.	New Zealand	NEW
14.	Chile	CHL	55.	Nicaragua	NIC
15.	China (PRC)	CHN	56.	Norway	NOR
16.	China (ROC)	CHT	57.	Outer Mongolia	OUT
17.	Colombia	COL	58.	Pakistan	PAK
18.	Costa Rica	COS	59.	Panama	PAN
19.	Cuba	CUB	60.	Paraguay	PAR
20.	Czechoslovakia	CZE	61.	Peru	PER
21.	Denmark	DEN	62.	Philippines	PHI
22.	Dominican Republic	DOM	63.	Poland	POL
23.	Ecuador	ECU	64.	Portugal	POR
24.	Egypt (UAR)	EGP	65.	Rumania	RUM
25.	El Salvador	ELS	66.	Saudi Arabia	SAU
26.	Ethiopia	ETH	67.	Spain	SPN
27.	Finland	FIN	68.	Sweden	SWD
28.	France	FRN	69.	Switzerland	SWZ
29.	Germany (DDR)	GME	70.	Syria	SYR
30.	Germany (FRG)	GMW	71.	Thailand	TAI
31.	Greece	GRC	72.	Turkey	TUR
32.	Guatemala	GUA	73.	Union of South Africa	UNS
33.	Haiti	HAI	74.	USSR	USR
34.	Honduras	HON	75.	United Kingdom	UNK
35.	Hungary	HUN	76.	USA	USA
36.	India	IND	77.	Uraguay	URA
37.	Indonesia	INS	78.	Venezuela	VEN
38.	Iran	IRN	79.	Vietnam (North)	VTN
39.	Iraq	IRQ	80.	Vietnam (South)	VTS
40.	Ireland	IRE	81.	Yemen	YEM
41.	Israel	ISR	82.	Yugoslavia	YUG

we may select such variables as the number of persons killed in domestic violence, the number of anti-government demonstrations, and for economic development, gross national product per capita, the number of cars per one thousand persons, and the Engel's index.

The aim here was to assess the practical applicability of field theory in general and specifically, to find the structure of Communist China's foreign behavior patterns. The study is a general-type and not a specific research, in the sense that neither particular attributes nor behaviors were pre-selected in the proposed model. The study, therefore, required no particular set of variables to be included. The more general aspects of the attributes/behaviors of the nations the variables represented, the better.

For parsimony, however, the number of variables was reduced to a manageable size. Three subjective criteria were used in the actual selection: first, most, if not all, of the concepts which have been frequently adopted in current leading studies were included, so that the result of the study could be compared easily with other studies; second, data had to be available; and third, there had to be sufficient variance to be analyzed for China.[94]

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[94]A good guideline for selecting "basic indicators" of major attribute and behavioral concepts of nations is given in Rummel, 1969a. Since this is a study of one nation's (China) foreign behavior, some variables which appear frequently in global studies are not adoptable, due to insufficient variance. For example, the variable "military action" had only two non-zero entries out of eighty-two dyads in the 1955 and the 1963 behavior spaces, and had to be eliminated. If more than eighty percent of the cases had the same value for a variable, it was excluded.

5.2.1 Attribute Variables

For attribute variables, the basic concepts (dimensions) delineated by the series of the Dimensionality of Nations (DON) Project studies[95] were adopted as the basic categories to select variables. The seven dimensions which appeared in Rummel's work (Rummel, 1969a) were economic development, power (= size), politics (= political orientation), foreign conflict, domestic conflict, Catholic culture (= cultural characteristics of the society), and density. These seven include virtually all the prominent concepts which are used in most of the international relations studies: power theory (*e.g.* Morgenthau, 1966; Organski, 1968), status theory (Lagos, 1963),[96] and the rank theory (Galtung, 1964).

Furthermore, these seven basic concepts were cross-checked against similar studies (Russett, 1967; Berry, 1960; and Cattell and Gorsuch, 1965) and were found to fit quite well with them.[97] For this reason, it seems safe to use these basic concepts to represent the variation in attribute space.

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[95]See Rummel, 1964, 1966, 1968b, and 1969a.

[96]Lagos used three concepts: power, wealth, and prestige. Since "prestige" can be understood as a second-order concept based on power and wealth, it can be eliminated (see Rummel, 1970b).

[97]For example, the intraclass correlation with Russett (1967) was .93 and with Berry (1960), .96. The technique for comparison employed was Ahmavaara's transformation analysis. See Rummel, 1969a, p. 134, and Ahmavaara and Markkanen, 1958, pp. 80-3. Only Rummel's politics dimension had a relatively low correlation with Russett's (-.54). In order to cover this gap, I selected relatively many variables in the category of politics.

Based on the above concepts, five basic categories were selected: power base, economic development, military power, political orientation, and ethno-religious attributes. In addition, a special category, relations with China was included. To measure the variation in these six categories, the following thirty-five variables were selected, based on a broad scanning of traditional studies about China's behavior and my own research experience (those with an asterisk are the marker variables of the seven dimensions in Rummel's study[98]).

1. Power Base

*population: "Modified present-in-area counts" (*Demographic Yearbook*, UN, 1956, p. 21).

national land area: "The total area of the specified geographical units, including inland water as well as such inhabited or uninhabitable stretches of land as may lie within their mainland boundaries" (*Demographic Yearbook*, UN, 1956, p. 24).

*population density: Total population divided by national land area.

proportion of arable land: Arable land divided by total land area. Data were measured in percentages. Arable land refers to "land planted to crops ... land temporarily fallow, temporary meadows for mowing, and rubber plantation" (*Yearbook of Food and Agricultural Statistics: Production*, FAO, 1959, p. 388).

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[98]The marker variable of a dimension is the variable which loaded highest on that dimension. The reason for selecting marker variables is that the broadest possible variations in nations' attributes can be uncovered with the smallest number of variables. Selection of the highest loaded variables from each of the independent basic vectors virtually guarantees that the chosen variables would cover most of the variance in A-space which was originally contained in nearly one hundred different variables used in Rummel's original study (Rummel, 1966 and 1969b).

energy production: Includes the primary sources of energy: coal and lignite, crude petroleum, natural gas and hydro-electricity. All energy data were converted to metric ton equivalent of coal.

steel production: "The total production of crude steel, both ingots and steel for castings, whether obtained from pig-iron or scrap" (*Statistical Yearbook*, UN, 1960, p. 246).

gross national product: Total value of goods and services produced in a country in a year's time.

2. Economic Development

literacy rate: Literates/population ten years of age or older. Literacy is defined as the ability to read and write.

*energy consumption per capita: Energy includes solid fuels, liquid fuels, natural and imported gas, and hydro- and imported electricity. All energy is measured in kilograms of coal which has equivalent heat.

telephone per capita: Telephone includes public and private telephones installed which "can be connected to a central exchange" (*Statistical Yearbook*, UN, 1960, p. 375).

population per physician: Physician refers to "all persons fully qualified or certified from a medical school" (*Statistical Yearbook*, UN, 1964, p. 651).

gross national product per capita: Gross national product divided by total population.

non-agricultural population/population: Non-agricultural population is the difference between the total population and the agricultural population. Agricultural population is defined as "all persons who depend on agriculture for a livelihood, that is to say, persons actively engaged in agriculture and their non-working dependents" (*Yearbook of Food and Agricultural Statistics: Production*, FAO, 1959, p. 389).

3. Military Power

size of armed forces: Number of military personnel. Civilians employed by the armed forces were excluded.

number of combat airplanes: Combat airplanes include fighter, fighter-bomber, bomber, attacker, interceptor, and armored reconnaissance planes.

defense expenditure: It includes total current and capital outlays.

4. Political Attributes

*bloc membership: Rating: 0 = Communist bloc membership, 1 = neutral bloc, 2 = Western bloc. Communist and Western bloc membership is determined by military treaties or alliances with the Soviet Union or the United States. The neutral bloc is a residual category.

Communist party membership/population: The number of party members is the estimate of the U.S. State Department.

*killed in domestic violence: Any deaths resulting directly from violence of an intergroup nature within a nation, thus excluding deaths by murder and execution.

*killed in foreign violence: The total number of deaths resulting directly from any violent interchange between countries.

U.S. economic aid received: Economic aid received from the Soviet Union.

colonialism: Rating: 0 = has been colonized in the past fifteen years, 1 = neither possessed colony nor was colonized, 2 = has possessed at least one colony in the past fifteen years.

freedom of group opposition: Rating: 0 = political opposition not permitted; groups not allowed to organize for political action; 1 = restricted political opposition allowed, groups free to organize politically, but oppositional role limited and they may not campaign for control of government; 2 = political opposition mostly unrestricted.

trade with Western bloc: Included both exports and imports. The Western bloc includes the following countries: AUL, BEL, CAN, CHT ('63 only), DEN, FRN, GMW, GRC, ITA, JAP ('63 only), KOS ('63 only), NTH, NEW, NOR, PAK, PHI, POR, TAI, TUR, USA, UNK.

trade with Communist bloc: The Communist bloc includes ALB, CHN, CZE, GME, HUN, KON, POL, RUM and USR.

trade direction index: The index was calculated with the following formula.

$$\text{trade with Western bloc} \div (\text{trade with Western bloc} + \text{trade with Communist bloc})$$

5. Ethno-religious Attributes

*Roman Catholics/population: in percentages.

Protestants/population: in percentages.

Moslems/population: in percentages.

Buddhists/population: in percentages.

languages: Number of languages with membership exceeding one percent of the population. Language here refers to the "mother tongue."

6. Relation with China

Chinese population/population: Rating: 0 = none, 1 = 0-100, 2 = 101-1000, 3 = 1,001-10,000, 4 = 10,001-100,000, 5 = 100,000-1 million, 6 = more than 1 million or more than ten percent of the population, 7 = more than fifty percent of the population, 8 = more than ninety percent of the population.

geographical distance from China: Distances are between capitals and were measured in centimeters on a twelve inch globe.

attitude toward Chinese issue in UN voting: Rating: 0 = favorable to China, 1 = neutral (abstention and absence), 2 = unfavorable.

The variable names and the corresponding codes used in this study are given in Table 2, and the data with sources and footnotes are given in Appendix I-A.

5.2.2 Behavioral Variables

For behavior space, the basic unit for behavior is a dyad, a pair of nations with one as the actor and the other as the object. In other words, the directed behavior of one actor to a particular object nation is defined as "behavior." In this study, there is only one actor--China; and, all dyads are China→other nations. Since the number

TABLE 2

LIST OF ATTRIBUTE VARIABLES

VARIABLE NUMBER	VARIABLE NAME	CODE
1	population	POPUL
2	national land area	AREAT
3	population density	DENST
4	proportion of arable land	ARLND
5	energy production	ENPRO
6	steel production	STPRO
7	gross national product	GNPTL
8	literacy rate	LITRC
9	energy consumption per capita	ENCON
10	telephone per capita	TELPH
11	population per physician	PHYSI
12	GNP per capita	GNPPC
13	non-agricultural population	NAGPO
14	geographical distance from China	GEODS
15	size of armed forces	FORCE
16	number of combat airplanes	COMPL
17	defense expenditure	DEFEX
18	bloc membership	BLOCM
19	communist party membership	COMST
20	killed in domestic violence	KILLD
21	killed in foreign violence	KILLF
22	U.S. aid received	USAID
23	U.S.S.R. aid received	URAID
24	attitude toward China issue in UN voting	UNVOT
25	colonialism	COLON
26	Roman Catholic/population	CATHL
27	Protestants/population	PROTS
28	Moslems/population	MOSLM
29	Buddhists/population	BUDDH
30	languages	LANGN
31	Chinese/population	CHINS
32	freedom of group opposition	GOPPO
33	trade with Western bloc	WTRAD
34	trade with Communist bloc	CTRAD
35	trade direction index	ITRAD

Definitions of the variables are given in the main text.

of cases (nations) is eighty-two, the number of dyads is eighty-one. Data were collected for all eighty-one dyads.

To select the behavioral variables, I again examined the ten basic dimensions delineated by Rummel:[99] salience, emigration and communication, UN voting, foreign student, export, international organization, official conflict behavior, diplomatic representation, self-determination voting, anti-foreign behavior.

Unlike the A-space variables, the conceptual map was not directly applicable to this study. Although good for global studies, the concepts were inadequate for a one-actor dyadic study, mainly because we cannot expect sufficient variances for many of the variables with which the concepts were operationalized. For example, one of the most important behavior of Communist China to be explained is her military conflict with her neighbors. But for most of the variables which were frequently used to measure military conflict, *i.e.* war, discrete military action, maneuver, border clash, however, there was little variation--only two out of eighty-one dyads had non-zero entries (CHT and IND). Another important behavior was China's political interaction with others. This is usually measured with the political activities (voting) in the United Nations. For China, however, the UN roll call votes could not be used since she had never been a member of the organization.

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[99]The ten dimensions are a composite of four accumulated studies done by Rummel. See Rummel, 1969a, pp. 140-1.

Considering these circumstances, I chose the following seventeen variables in four categories.

1. Economic Behavior

export to the object: Total export, f.o.b. price in U.S. dollars, during the year.

import from the object: Total import, c.i.f. price in U.S. dollars, during the year.

economic aid to the object: Includes grants and long-term loans.

economic visit to the object: Includes government officials and civilians. Economic visit is defined as the visit, the main declared purpose of which is economic--trade conference, negotiation, market survey, etc.

economic visit from the object: Same as above.

2. Political Behavior

diplomat sent to the object: Includes only embassies. Rating: 0 = no diplomatic relations and no envoy; 5 = agreed to establish diplomatic relations, but no envoy has arrived yet; XX = 10 + the number of years since the envoy arrived.

diplomat from the object: Same as above.

treaties signed: Includes only bilateral treaties. Following the Chinese practice, a joint communique signed by the governments' official representatives is regarded as a treaty.

co-membership in international non-government organizations: Includes all NGO's.[100]

official political visit to the object: Includes only the visits by the following officials: the President of the People's Republic of China (PRC), Prime Minister, Deputy-prime Ministers, Minister of Foreign Affairs, Minister of Defense, Chairman of the Central Committee of the China Communist party (CCP), and the Chairman of the Standing Committee of the People's Congress of the PRC.

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[100]China was a member of only one IGO (Joint Nuclear Research Institute, 1956). The IGO membership was not used as a separate variable in this study.

official visit by the objects: Includes only the visits by the heads of government and cabinet members.

3. Verbal Communication

positive communication: Directed communication by the policy makers who are defined to include, the Chairman of the Central Committee of the CCP, the President of the PRC, the Chairman of the Standing Committee of the People's Congress of the PRC, the Prime Minister, the Minister of Foreign Affairs, the Minister of Defense, the Central Committee of the CCP, the presidium of the PRC, the Standing Committee of the People's Congress, and the Cabinet of the PRC. The data were collected from the articles of the *Jen-min Jih-pao* using the following formula

$$S = \sum_{i=1}^{f} (L_i \times D_i)$$

where S is the score of the total positive communication to the object,

L is the size of the article
- 1 = less than 30 lines or equivalent
- 2 = 30-100 lines or equivalent
- 3 = 100-200 lines or equivalent or the second top
- 4 = more than 200 lines or equivalent or the top

D is the cooperative scale
- 1 = friendly comment
- 2 = formal congratulations
- 3 = verbal support or appraisal of the object's policy
- 4 = suggestion of support
- 5 = concrete offer of support including detailed schedule
- 6 = decision of supportive action

f is the total number of articles which contain the verbal communication during the year.

negative communication: Directed communication by the policy makers (definition same as above), with the same formula with a difference in meaning only for the D scale, where

D is the degree of hostility scale
- 1 = critical comment
- 2 = accusation, agitation, or the equivalent
- 3 = demand of corrective actions
- 4 = warning (without specified sanctions)
- 5 = threat (with concrete sanction)
- 6 = decision of hostile action

4. Salience (Concern)

unofficial political visit to and from the object: The visits by the leaders of the parties of the object nations which were currently not in power (*e.g.* Italian Communist party, Japanese Communist party)/the visits by China's party leaders with the non-ruling political party leaders of the object nations. Measured in terms of frequency.

degree of official concern: Data were collected from the *Jen-min Jih-pao* using the following formula:

$$C = \sum_{i=1}^{f} R_i$$

where C is the degree of concern score
R_i is an article reporting about the object nation, without regard to the subject matter, scaled according to the length of the article (scales are same as for positive communication)
f is the total number in a year.

cultural visit to the object: All non-political, non-economic visits by the Chinese citizen disregarding the rank of the person.

cultural visit from the object: Same as above.

The variable names and corresponding codes used in this study are presented in Table 3, and data with footnotes and sources are given in Appendix I-B. The data were difficult to collect, especially for B-space variables, since China has revealed few statistics. For variables 1-7, China's own publications (mainly the Yearbook) were used primarily, with a thorough check against the publications of the China watchers. For variables 9-17, however, data were generated directly from *Jen-min Jih-pao*.[101]

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[101]With a specially designed code sheet, the contents of all articles contained in the 1955 and 1963 issues of the *Jen-min Jih-pao* (730 daily issues) were converted into codes. A total of 20,770 code sheets were filled and all necessary data were generated from these master code sheets.

TABLE 3

LIST OF BEHAVIORAL VARIABLES

VARIABLE NUMBER	VARIABLE NAME	CODE
1	export to the object	EXPOR
2	import from the object	IMPOR
3	economic aid to the object	ECAID
4	diplomat sent to the object	DIPFP
5	diplomat from the object	DIPTP
6	treaties signed	TREAT
7	co-membership of NGO	CONGO
8	official political visit to the object	POFVT
9	official political visit from the object	POFVF
10	unofficial visit from the object	PNOVF
11	economic visit to the object	ECOVT
12	economic visit from the object	ECOVF
13	cultural visit to the object	CULVT
14	cultural visit from the object	CULVF
15	official concern	CONCN
16	positive communication	POCOM
17	negative communication	NECOM

Definitions of the variables are given in the main text.

5.3 Missing Data Estimation

In general, there are four approaches to solving the problem of missing data in cross-national data: 1) the order of the data matrix can be reduced until only the complete data remain, 2) missing data may be treated as blanks in the analysis, 3) some of the missing data may be estimated judgementally, or 4) all the data may be estimated by ratings, mean values, measurement scale reduction, factor analysis, or regression analysis (see Wall and Rummel, 1969, p. 1).

In this study, methods 3) and 4) were applied jointly. First, so far as I deemed it adequate, I estimated the missing data subjectively based on my knowledge. Then, I estimated the remainder using the MISDAT program developed by Wall and Rummel.[102] With this method, the available data for each variable were regressed on the available data for the other variables to determine regression estimates for the missing data. Then, with the estimated data included, the computations were repeated again and again until the estimates converged to stable values for the missing data. This process was applied to all variables with missing data. In the data presented in Appendix I-A and I-B, those which were subjectively estimated were marked with the letter "R" (following the figures) and those which were machine-estimated were marked with "M."

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[102]See Wall and Rummel, 1969, pp. 1-2. This is a kind of regression estimate method. The recent version of the computer program for MISDAT, called the Dynamic Missing Data Estimation Program (the algorithm remains unchanged) is available at the DON Project.

5.4 Data Transformation

Although the normalities of the distribution of each variable are not required in this kind of population study,[103] the heavily skewed nature of the variables affects the overall relations among variables. Even the addition of one extreme outlying observation may change completely the correlation between two variables in a small population. This has been one of the most serious problems in working with empirical data. The prevailing practice has been to transform the data in order to improve the normalcy of frequency distribution, for example, by taking the logarithm of the original values.

Practically, however, transformation brings another problem--its justification. Why must a proposed relationship among the variables appear with the data transformed in a particular way? The proposed relationship must hold regardless of the units of measurement employed if it is to be a general lawlike relationship.

Exclusion of the case with an extreme value also cannot be justified. In the actual world data, for example, the U.S.A. has extremely high values for various variables measuring power and economic development. These extreme values obviously affect the correlations among the variables, and we shall have patterns of a nation's behavior which, without the U.S.A., may be completely different. Thus, we cannot justify the exclusion of the extreme case, if

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[103] If our study is a sample study from which the relations among variables in the universe are supposed to be inferred, we need multivariate normal distribution (at least an approximation) of each variable against all other variables. Otherwise, we cannot measure the reliability of derived statistics by standard indices like standard error.

we want to look at a world phenomenon as it is. And again if the proposed relationship among the variables is a lawlike generalization, the basic form of that relationship must appear whether we exclude certain cases or not.

Based on this simple argument, I designed a unique method to assess the reliability of my analyses. First I did all the analyses with the data in its original form. Then, I transformed all skewed variables which exceeded the value of 2.5,[104] and analyzed them. Third, I reduced the number of cases to fifty-six from the original eighty-two by eliminating those nations whose entries are zeroes across more than ten variables out of seventeen behavior variables and did the same analysis.[105] And, finally, the reduced matrix was tranformed and reanalyzed.

Then, the results of the four different analyses were cross-checked against each other to get the stable relationship among the variables, which were free from data manipulations. From now on, these four data sets will be referred to as O (original data set), T (transformed data set), R (reduced data set), and RT (reduced and transformed data set).

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[104]This was done for both the 1955 and the 1963 spaces. In A-space, nineteen variables and in B-space six variables were transformed. For all these twenty-five variables, the square roots of the original values were taken.

[105]The excluded nations are: BOL, CHL, COL, COS, DEN, DOM, ECU, ELS, ETH, GRC, GUA, HAI, HON, IRE, JOR, LBR, LBY, MEX, NIC, PAN, PAR, PER, POR, SPN, URA, and YEM.

CHAPTER VI

ATTRIBUTE DIMENSIONS

Theoretically, there may be an infinite number of concepts with which a nation's attribute can be described. Since there is no rule for which concept one must include in his study (theory), the decision of selecting concepts has to be made by the one who builds the theory.[106] In field theory, however, the concepts are not specified by the theory building. The theory simply defines a general relationship between a nation's attribute distances from the object nation and her behavior toward the object nation in terms of basis dimensional vectors of both A- and B-spaces without specifying with what concepts the basis should be delineated.

In this kind of general theory, the ideal set of attribute variables, therefore, is one which exhausts all the variability in nations' attributes. In practice, however, this is unavailable, and in this particular study, thirty-five variables were selected on the basis of substantial significance--mainly the popularity of the concepts in current leading studies.

Field theory, however, assumes that attribute space has a finite number of dimensions, from which all concepts are derivable as

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[106]However, there are some practical criteria: 1) the concepts must be meaningful for interested people; 2) the smaller the number of concepts in a theory, the better; 3) the meanings of the concepts must be as clear as possible. A comprehensive guideline for selecting indicators of the concepts is given in Rummel, 1969a.

a linear combination of the basis dimensional concepts. This means that once the basis dimensions are known, we can represent all the variability in attributes with a set of dimensional vectors no matter how many original variables there were. Practically, however, we cannot discover the exact basis dimensions, because empirically we are looking for a basis for a set of finite variables. The one we deal with, therefore, is an approximate basis of the space. In this study, unless specified otherwise, this approximated basis of the space will be referred to.

In order to delineate the basis dimensions of attribute space, the space consisting of the aforesaid thirty-five variables was factor analyzed. The principal component technique and the component factor model were used.[107] To get the simplest factor structure (the clearest clustering of variables), they were rotated orthogonally using the varimax criteria.[108]

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[107]Field theory deals with all variances, common as well as specific, of the variables; therefore, the component model was used.

[108]An oblique rotation was avoided, because the resulting bases were to be used in multiple regression analysis and canonical analysis. If the factors are mutually interrelated, we cannot distinguish the contribution of the individual factors from the interaction effects among them.

The dimensionality of the space was fourteen,[109] and each factor was labeled substantively by examining highly loaded variables on the dimensions. The fourteen rotated factors of the original data are presented on Table 4, and the labels of the factors with the variables they represent are given in Table 5.

To assess the reliability of the analysis, I repeated the factor analysis (the same factor technique and rotation procedure) three more times, each time with one of the three remaining parallel data sets I mentioned earlier (5.4): transformed data (T), data with reduced cases (R) and reduced and transformed data (RT). Then, the factor loadings of the variables on each basis dimension of the three data sets were cross-checked against the corresponding loadings of the original data set. Comparisons were made in terms of the product-moment correlations between the factors of the two matrices (original data and the other) after the factors of one matrix (the other) were rotated to a least squares fit to those of another matrix (original data set).[110]

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[109]In the component factor model, the dimensionality is usually equal to the number of the original variables. For practical purposes, we cut off relatively insignificant factors. To determine the number of factors, I considered the following facts: 1) both in the 1955 and the 1963 spaces, fourteen factors cover more than 90 percent of the total variance, 2) from the fifteenth eigenvector, the eigenvalues do not reduce much (scree test; the eigenvalue of the fourteenth eigenvector was .56 and .54 for the 1955 and 1963 spaces, respectively), which means that the variances loaded on the remaining eigenvectors may safely be assumed to be random errors, and 3) in the four different analyses (O, T, R, and RT), all the fourteen factors were identifiable across the different data sets.

[110]For the factor comparison, Ahmavaara's transformation method was employed.

TABLE 4

FACTOR LOADINGS OF 35 A-SPACE VARIABLES

ON FOURTEEN BASIS DIMENSIONS

(1) 1955 ORIGINAL DATA

VARIABLES	I POWER	II PORIE	III DEVEL	IV WESTC	V URAID	VI AGRIC	VII ORIEN
1 POPUL	-29	03	06	-05	83	05	15
2 AREAT	-46	06	-16	08	39	-39	07
3 DENST	05	-05	-14	04	04	86	16
4 ARLND	-07	27	-11	07	08	79	-25
5 ENPRO	-97	-02	-17	-01	06	01	01
6 STPRO	-96	-02	-20	02	03	04	01
7 GNPTI.	-98	-02	-18	01	08	-00	03
8 LITRC	-11	10	-71	40	02	19	-04
9 ENCON	-51	04	-73	06	-02	21	-03
10 TELPH	-33	-07	-86	-07	-04	-05	02
11 PHYSI	01	09	15	-04	-05	02	06
12 GNPPC	-47	-08	-80	04	-04	00	-03
13 NAGPO	-13	-08	-79	27	-07	17	-08
14 GEODS	-02	-44	-03	49	-15	-37	-50
15 FORCE	-68	15	-06	04	54	-04	10
16 COMPL	-97	04	-15	01	08	-07	01
17 DEFEX	-98	-02	-15	-02	03	-01	04
18 BLOCM	-00	-85	-08	14	-20	-05	02
19 COMST	-02	78	-01	18	-03	23	-04
20 KILLD	03	14	-01	02	08	06	-01
21 KILLF	-10	19	04	01	-01	04	11
22 USAID	02	-20	25	-10	-06	30	13
23 URAID	00	17	07	03	90	07	05
24 UNVOT	-04	-82	05	19	-21	-03	-08
25 COLON	-16	-30	-54	19	12	10	-26
26 CATHL	04	-33	12	74	-04	02	-34
27 PROTS	-03	08	-84	-11	-01	-11	-07
28 MOSLM	02	-05	36	-83	-06	-10	-24
29 BUDDH	05	29	22	01	-06	-06	75
30 LANGN	-04	03	13	-13	10	-04	01
31 CHINS	-20	-11	02	01	25	-01	86
32 GOPPO	00	-42	-22	09	-09	02	02
33 WTRAD	-60	-26	-54	-04	-02	20	08
34 CTRAD	-29	-02	-46	-08	04	23	-10
35 ITRAD	01	-77	-09	01	12	15	-16
% OF TOTAL VARIANCE	18.9	10.3	14.6	5.5	6.3	6.0	5.8

(CONTINUED)

TABLE 4

(CONTINUED)

FACTOR LOADINGS OF 35 A-SPACE VARIABLES

ON FOURTEEN BASIS DIMENSIONS

(1) 1955 ORIGINAL DATA

VARIABLES	VIII DIVER	IX WELFA	X POSTA	XI CTRAD	XII COLON	XIII FCONF	XIV USAID
1 POPUL	-23	-01	12	-09	04	01	09
2 AREAT	-41	-06	03	-23	-13	14	07
3 DENST	05	-05	-05	-21	03	08	07
4 ARLND	02	08	20	11	-07	-04	16
5 ENPRO	01	-00	-01	-02	-01	01	-04
6 STPRO	-01	01	-02	-10	00	04	-00
7 GNPTL	-02	00	01	-03	02	02	01
8 LITRC	19	-26	06	-05	03	-05	01
9 ENCON	02	-09	03	-10	-03	-07	-21
10 TELPH	09	-02	-02	09	13	-09	-05
11 PHYSI	-06	92	00	-01	-03	-06	-09
12 GNPPC	07	-08	-01	-02	11	-04	-13
13 NAGPO	11	-22	09	-17	04	00	-09
14 GEODS	10	-10	08	01	-03	-07	-14
15 FORCE	-20	-07	-02	-16	-13	17	13
16 COMPL	-06	-01	-02	00	-01	06	04
17 DEFEX	04	00	01	05	01	-02	-02
18 BLOCM	14	-01	-05	-08	14	-17	16
19 COMST	-01	-21	19	-03	-30	-01	-12
20 KILLD	03	-00	96	02	-06	15	-01
21 KILLF	-07	-06	16	-05	-03	92	-07
22 USAID	-19	-15	-01	-04	00	-10	76
23 URAID	10	-04	-01	10	-08	-05	-13
24 UNVOT	-02	-15	-09	-19	-08	-13	-01
25 COLON	29	15	-07	-18	-38	01	18
26 CATHL	15	-17	10	-01	-03	-08	-21
27 PROTS	-23	14	-06	-04	-02	14	07
28 MOSLM	-03	-10	06	-07	-08	-09	-08
29 BUDDH	21	22	-10	02	12	06	19
30 LANGN	-90	07	-03	07	01	05	11
31 CHINS	-15	-09	08	02	-05	08	-05
32 GOPPO	03	-03	-09	-09	80	-04	02
33 WTRAD	07	-00	02	-31	08	-09	-14
34 CTRAD	08	00	-03	-69	13	12	05
35 ITRAD	-11	-17	10	40	07	05	-07
% OF TOTAL VARIANCE	4.2	3.6	3.2	3.0	3.0	3.1	2.7

(CONTINUED)

TABLE 4

(CONTINUED)

FACTOR LOADINGS OF 35 A-SPACE VARIABLES

ON FOURTEEN BASIS DIMENSIONS

(2) 1963 ORIGINAL DATA

VARIABLES	I POWER	II PORIE	III DEVEL	IV WESTC	V URAID	VI AGRIC	VII ORIEN
1 POPUL	-41	-13	06	05	02	02	-07
2 AREAT	-64	-06	-08	-02	01	-28	-03
3 DENST	05	03	-13	13	-07	91	-04
4 ARLND	-03	-38	03	-15	17	66	-08
5 ENPRO	-97	-03	-17	-01	-02	-07	02
6 STPRO	-94	-02	-21	03	-01	09	-03
7 GNPTL	-95	05	-24	02	-05	01	-01
8 LITRC	-09	-11	-51	-03	02	13	-22
9 ENCON	-42	-16	-78	-12	-08	15	-10
10 TELPH	-24	12	-90	01	01	-06	-02
11 PHYSI	04	-03	14	08	02	-02	09
12 GNPPC	-36	11	-87	-05	-05	03	-04
13 NAGPO	-12	11	-76	-21	02	21	-10
14 GEODS	02	38	03	-66	-06	-36	-33
15 FORCE	-82	-19	-06	06	13	05	-02
16 COMPL	-87	-15	-10	01	11	-04	-00
17 DEFEX	-94	01	-17	00	-03	-06	-00
18 BLOCM	02	89	-06	-08	07	08	-11
19 COMST	-07	-83	-02	-14	10	16	-13
20 KILLD	01	07	06	12	02	00	-02
21 KILLF	-04	-05	11	05	03	09	08
22 USAID	03	16	19	02	-08	09	08
23 URAID	05	-57	12	04	-60	-01	03
24 UNVOT	-06	75	11	-28	-04	-00	-19
25 COLON	-16	15	-40	-16	-04	19	-03
26 CATHL	05	30	16	-60	-10	03	-53
27 PROTS	-05	-10	-78	05	28	-14	-07
28 MOSLM	04	-01	25	-09	-03	-07	92
29 BUDDH	03	-05	26	89	-02	-02	-19
30 LANGN	-09	-05	12	04	-01	-04	07
31 CHINS	-26	07	04	54	-21	-01	-22
32 GOPPO	01	63	-41	-12	13	01	-04
33 WTRAD	-61	27	-56	01	-19	29	-01
34 CTRAD	-43	-58	-07	-09	11	11	-11
35 ITRAD	07	91	-08	-13	07	-02	01
% OF TOTAL VARIANCE	19.1	13.2	13.5	6.2	1.9	5.1	4.3

(CONTINUED)

TABLE 4

(CONTINUED)

FACTOR LOADINGS OF 35 A-SPACE VARIABLES

ON FOURTEEN BASIS DIMENSIONS

(2) 1963 ORIGINAL DATA

VARIABLES	VIII DIVER	IX WELFA	X POSTA	XI CTRAD	XII COLON	XIII FCONF	XIV USAID
1 POPUL	09	04	-10	12	04	-59	57
2 AREAT	19	-01	-02	55	02	-21	09
3 DENST	-06	-07	-01	07	02	-16	01
4 ARLND	05	-05	03	-28	31	15	20
5 ENPRO	02	-02	-01	-02	02	-06	-01
6 STPRO	03	-04	-02	18	01	03	-03
7 GNPTL	-04	-02	-01	-15	04	02	01
8 LITRC	-16	-66	15	12	12	07	-00
9 ENCON	-06	-14	01	-00	02	05	-12
10 TELPH	-08	-08	-02	-10	08	01	-04
11 PHYSI	-02	90	09	02	-03	00	-02
12 GNPPC	-07	-15	-04	-04	05	07	-01
13 NAGPO	-08	-37	-11	14	01	04	-09
14 GEODS	-13	-07	-07	00	02	20	-07
15 FORCE	09	-05	04	26	05	-34	12
16 COMPL	14	-04	01	38	04	-04	-00
17 DEFEX	-05	-01	01	-21	03	-02	-01
18 BLOCM	-10	-08	08	-01	07	07	02
19 COMST	-01	-18	07	02	-11	-02	-12
20 KILLD	-03	04	94	00	-11	01	12
21 KILLF	-03	03	-02	-00	-02	-94	-03
22 USAID	19	-02	20	-01	-08	01	84
23 URAID	04	-02	-05	-10	08	00	47
24 UNVOT	-00	-31	14	-02	-05	-02	-20
25 COLON	-05	-12	-20	00	78	-01	-05
26 CATHL	-26	-22	-07	04	-03	12	-11
27 PROTS	20	19	02	19	20	03	-03
28 MOSLM	02	16	-03	-03	-03	02	03
29 BUDDH	-11	06	05	-03	-15	02	-04
30 LANGN	94	05	-03	09	-03	-03	18
31 CHINS	16	-04	19	06	05	-54	02
32 GOPPO	-04	-31	-24	02	-14	15	26
33 WTRAD	-12	-02	-05	-09	00	04	-01
34 CTRAD	16	-11	02	59	-04	02	-03
35 ITRAD	07	13	06	-10	00	-02	04
% OF TOTAL VARIANCE	3.9	5.3	3.4	3.4	2.5	5.3	4.4

TABLE 5

LABELS OF FOURTEEN A-SPACE

BASIS DIMENSIONS

FACTOR	FACTOR LABELS	FACTOR CODE	HIGH-LOADING VARIABLES
I	Power	POWER	ENPRO, STPRO, GNPTL, FORCE, COMPL, DEFEX
II	Political Orientation	PORIE	BLOCM, COMST, UNVOT ITRAD
III	Economic Development	DEVEL	LITRC, ENCON, TELPH, GNPPC, NAGPO
IV	Western Culture	WESTC	GEODS, CATHL
V	U.S.S.R. Aid	URAID	URAID
VI	Agricultural Culture	AGRIC	DENST, ARLND
VII	Oriental Culture	ORIEN	MOSLM, BUDDH, CHINS
VIII	Ethno-religious Diversity	DIVER	LANGN
IX	Welfare	WELFA	PHYSI
X	Political Stability	POSTA	KILLD
XI	Communist Trade	CTRAD	CTRAD
XII	Colonialism	COLON	COLON
XIII	Foreign Conflict	FCONF	KILLF
XIV	U. S. Aid	USAID	USAID

Two kinds of correlation were calculated: the correlation between each pair of individual corresponding dimensions, and the correlation between the two super columns each of which was formed by connecting all columns in the matrix into one. The results of the comparison are presented in Table 6-1. As we can see in the table, all four data sets have very similar factor patterns: all the overall correlations of T, R and RT with O in both years exceed .98. This means that the factors can be derived using skewed data with some extreme outliers. This is an important finding, because it supports the generality of field theory, *i.e.*, the basis dimensions of the space is not affected by the unit of measure of the data. This finding suggests that we can rely on the original data for further analyses. From now on I will use the original data set as a primary data set for all analyses. For a loading by loading comparison the loadings of all four data sets are placed in one combined table in Appendix II-A.

It is also clear that the dimensions are sufficiently similar between the 1955 and the 1963 spaces. The factors of the two spaces were compared with the same technique used above. The results are summarized in Table 6-2. Considering measurement error, a correlation of .95 is sufficient to say that the factor patterns are the same across the two spaces. This stable factor pattern over time is significant, since this also supports axiom 3 of field theory.

The factor scores of these fourteen factors were calculated and the scores were used as the indicators of the A-space basis dimensions for testing the field theory models. The factor scores of the fourteen

TABLE 6-1

A-SPACE FACTOR PATTERN STABILITY AMONG DIFFERENT DATA SETS

FACTORS		1955			1963		
		T[a]	R	RT	T	R	RT
1	POWER	.99[b]	.98	.97	.99	1.00	.99
2	PORIE	.99	1.00	.99	.98	.97	.99
3	DEVEL	.98	.93	.91	.61	.98	.98
4	WESTC	.99	.99	.98	.99	.72	.72
5	URAID	.99	.92	.60	.68	.98	.71
6	AGRIC	.97	1.00	.71	.97	.98	.98
7	ORIEN	.99	.84	.96	.74	.83	.79
8	DIVER	.98	.98	.89	.95	.93	.96
9	WELFA	.94	.96	.91	.95	.99	.96
10	POSTA	.93	.99	.93	.86	.91	.70
11	CTRAD	.93	.97	.89	.99	.82	.84
12	COLON	.97	.86	.71	.97	.99	.96
13	FCONF	.88	.91	.96	.97	.98	.98
14	USAID	.75	.92	.69	.78	.97	.89
OVERALL[c] CORRELATION		.99	.99	.98	.98	.99	.98

[a] T = Transformed data (N = 82)
R = Reduced data (N = 56)
RT = Reduced and Transformed data (N = 56)

[b] Correlation between the loadings of the factor of the indicated data with the loadings of the corresponding factor of the original data.

[c] Correlation between all loadings of the indicated data and those of the original data. Correlation was calculated between the two super columns, each of which was formed by connecting all columns in the matrix into one long column.

TABLE 6-2

A-SPACE FACTOR PATTERN STABILITY OVER TIME:

FACTOR COMPARISON BETWEEN 1955 AND 1963 SPACES

FACTORS	KINDS OF DATA			
	O[a]	T	R	RT
1 POWER	1.00[b]	.99	1.00	1.00
2 PORIE	.96	.96	.98	.98
3 DEVEL	.95	.77	.96	.97
4 WESTC	.89	.92	.94	.97
5 URAID	.33	.51	.62	.68
6 AGRIC	.95	.99	.95	.99
7 ORIEN	.82	.91	.92	.92
8 DIVER	.88	.85	.92	.91
9 WELFA	.94	.48	.96	.32
10 POSTA	.93	.93	.92	.91
11 CTRAD	.72	.27	.65	.52
12 COLON	.58	.61	.86	.88
13 FCONF	.91	.95	.94	.94
14 USAID	.81	.66	.87	.04
OVERALL[c] CORRELATION	.95	.96	.95	.96

[a] O = Original Data (N = 82)
T = Transformed Data (N = 82)
R = Reduced Data Matrix (N = 56)
RT = Reduced and Transformed (N = 56)

[b] Correlation between corresponding factors in 1955 and 1963 spaces. Signs are ignored.

[c] Correlation between actual 1963 factor loadings (F_{63}) and the 1963 factor loadings estimated from 1955 factor loadings from the following equation,

$$\hat{F}_{63} = F_{55}L$$

where L is the transformation matrix for least-square fit. Correlation was calculated between two super columns, each of which was formed by connecting all columns one after another, in the F_{63} and the $\hat{F}_{63}$ matrices, respectively.

rotated factors are given in Appendix III-A.

The fourteen factors also show the stability of the factor patterns across different studies. A-space has been previously analyzed by others.[111] The fourteen factors of this study are almost the same as those of Rummel's finding. A comparison of the fourteen factors of this study and the fifteen factors of Rummel's study (Rummel, 1964b) is given in Table 7. This similarity across different studies[112] seems to indicate that there is a fundamental basis of nations' attributes and we shall be able to find a stable common indicator which could represent nations' attributes generally.

The fourteen factors also identified all popular concepts frequently adopted in international relations studies. As shown in Table 5, the most general concepts like power, economic development, political orientation emerged distinctly as the basis dimensions of the attribute space.

The first factor was labeled "power" dimension (POWER), on which defense expenditure (.98),[113] total GNP (.98), combat airplanes (.98),

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[111]See Sawyer, 1967; Rummel, 1967, 1968; Van Atta and Rummel, 1970. Rummel did a component analysis of 236 attributes for 82 nations (the same nations as in this study) on 1955 data and extracted fifteen basis dimensions (Rummel, 1964b). In Table 7, "Rummel's study" refers to Rummel, 1964b, "Orthogonally Rotated Factor Tables for 236 Variables."

[112]The similarity is partly due to the fact that seven marker variables of Rummel's study were included in this study. Even with this "hooking," the results are significant, since there were more different variables than similar variables in the two studies.

[113]In parentheses are the loadings for the original data analysis, 1955 (0-55). For loadings for other analyses, see Appendix II-A. For simplicity, signs are dropped.

TABLE 7

A-SPACE FACTORS:
COMPARISON WITH RUMMEL'S STUDY[a]

FACTORS OF THIS STUDY	HIGH-LOADING VARIABLES			RUMMEL'S FACTORS
	LOADING	VARIABLE NAME	LOADING	
POWER (Power)	.98	Defense expenditure	.83	Power
	.98	Gross national product	.88	
	.98	Combat airplanes	--	
	.97	Energy production	.84	
	.96	Steel production	.66	
	.68	Size of armed forces	.73	
	.29	Population	.91	
POLIE (Political Orientation)	.85	Bloc membership	.86	Political Orientation
	.82	UN voting on China issue	--	
	.78	Communist Party Membership	.49	
	.77	Index of trade direction	--	
	--	English titles translated/ all translated	1.10	
DEVEL (Economic Development)	.86	Telephone/pop	.95	Economic Development
	.84	Protestants/pop	.65	
	.80	GNP/pop	.91	
	.79	Non-agricultural pop/ pop	.92	
	.73	Energy consumption/pop	.90	
	.71	Literacy	--	
	--	Pupils in primary school	.84	
WESTC (Western Culture)	.83	Moslem(negative)/pop	.44	Catholic Culture
	.74	Catholic pop/pop	.73	
	.49	Geographical distance from China	--	
	--	Air distance from U.S. (negative)	.71	
FCONF (Foreign Conflict)	.92	Killed in foreign conflict	.76	Foreign Conflict
	--	Threats	.85	
	--	Accusations	.83	
AGRIC (Agricultural Culture)	.86	Population/land area	.90	Size
	.79	Arable land/land area	.73	
ORIEN (Oriental Culture)	.75	Buddhist pop/pop	.56	Asian
	.86	Chinese pop/pop	--	
	--	Mongolian pop/pop	.60	
	--	Religious groups > 1% pop	.65	
POSTA (Political Stability)	.96	Killed in domestic violence	.69	Domestic Conflict
	--	General strikes	.69	
DIVER (Diversity)	.90	Language groups > 1% pop	.69	Ethnic-Linguistic Diversity

[a]Refers to Rummel, 1966b; "Orthogonally Rotated Factor Tables for 236 Variables."

energy production (.97), steel production (.96) and size of armed forces (.68) loaded highly. All these variables are well known indicators of power,[114] and we can give the label without hesitance.

The second factor on which bloc membership (.85), UN voting (.82), communist membership (.78) and trade direction index (.77) loaded highly is called the "political orientation" dimension (PORIE), since all of these variables are related, directly or indirectly, to the nation's political orientation. The third factor was labeled "economic development" (DEVEL), since telephone (.86), Protestants (.84), GNP per capita (.80), non-agricultural population (.79), energy consumption (.73) and literacy (.71) loaded highly on it. Except for Protestants, all variables are indicators of economic development. The variable Protestants loaded highly on this dimension, because most economically developed nations had a high proportion of Protestants among the population.

Catholic population (.74), geographical distance (.66), and either Moslem population (.83; 1955) or Buddhist population (.85; 1963) loaded highly on the fourth factor. This means that the nations with a high percentage of Roman Catholics and with a low percentage of Moslems or Buddhists and geographically distant from China have high scores on this dimension. For this reason, I labeled the factor "Western culture" (WESTC). Only Soviet aid (.90) loaded highly on the

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[114]Out of six highly loaded variables, DEFEX, COMPL and FORCE are indicators of current military power, while the other three--GNPTL, ENPRO and STPRO--are the indicators of the power capability of the nation, which shows the potential for future military power.

fifth factor which was, therefore, named "U.S.S.R. aid" (URAID).

The sixth factor was the one which Rummel labeled as the "density" factor in his recent study.[115] Two variables, density (.86) and arable land (.79), loaded highly on this factor which I labeled "agricultural culture"(AGRIC) in a sense that the factor indicates common characteristics of agricultural culture. The seventh factor was named "oriental culture" (ORIEN), because Chinese population (.86) and either Buddhist population (.75; 1955) or Moslem population (.92) loaded highly on it.

Only single variables loaded highly on the eighth to fourteenth factors and they were labeled, according to the concepts which the variables were supposed to represent. They were "diversity" (DIVER←LANGN),[116] "welfare" (WELFA←PHYSI), "political stability (POSTA←KILLD), "communist trade partner" (CTRAD←CTRAD), "colonialism" (COLON←COLON), "foreign conflict" (FCONF←KILLF) and "U.S. aid" (USAID←USAID).

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[115]See Van Atta and Rummel, 1970, p. 11.

[116]The first codes are for factor names, and the latter, the codes of highest loaded variables.

CHAPTER VII

CHINA'S FOREIGN BEHAVIOR DIMENSIONS

For behavior space, the same factor analysis as in A-space analysis was carried out in order to delineate the basis dimensions of China's foreign behavior. The same criteria as for the A-space analysis were applied to determine the number of factors; as a result, seven factors were extracted. The factors are presented in Table 8.

A substantive label was given to each dimension in terms of the behavior most correlated with it. The first factor, on which export (.97) and import (.98) loaded highly, was labeled "trade" (TRADE). The second factor was named "formal diplomacy" (FDIPL), since diplomat from Peking (.90) and diplomat to Peking (.90) loaded highly on it. The third factor on which non-official political visit (.86), economic visit to the object (.83) and economic visit from the object (.66) loaded highly in both the 1955 and the 1963 spaces was labeled "informal diplomacy" (INDIP). The other remaining four dimensions were labeled with the names of the highest loading variables: economic aid (ECAID; .96), negative communication (NECOM; .99), co-membership in international non-governmental organization (CONGO; .89) and official political visit (POFVT; .84). The labels and the variables loading highly ($\geq$.50) are given in Table 9 to show the structure of each factor at a glance.

TABLE 8

FACTOR LOADINGS OF 17 B-SPACE VARIABLES

ON SEVEN BASIS DIMENSIONS

(1) 1955 ORIGINAL DATA

FACTORS	I TRADE	II FDIPL	III INDIP	IV ECAID	V NECOM	VI CONGO	VII VISIT
1 EXPOR	97	07	-13	02	03	-08	-03
2 IMPOR	98	09	-07	03	03	-07	-04
3 ECAID	13	17	-02	96	02	01	05
4 DIPFP	22	90	-11	14	04	-13	23
5 DIPTP	23	90	-11	13	04	-18	21
6 TREAT	52	39	-29	17	07	-32	39
7 CONGO	15	22	-20	-01	-04	-89	11
8 POFVT	08	38	-02	04	03	-13	84
9 POFVF	-03	08	-75	18	-05	11	42
10 PNOVF	23	-02	-86	08	01	-25	03
11 ECOVT	41	29	-66	-23	01	-04	-25
12 ECOVF	30	17	-83	-07	01	-17	-02
13 CULVT	67	46	-27	-10	05	-04	06
14 CULVF	54	37	-30	-08	-04	-37	42
15 CONCN	83	18	-39	11	-20	-11	18
16 POCOM	92	20	-18	18	-01	-07	13
17 NECOM	02	-06	-01	-02	-92	-03	-02
% OF TOTAL VARIANCE	28.8	15.1	17.1	6.7	6.2	7.3	8.5

(CONTINUED)

TABLE 8

(CONTINUED)

FACTOR LOADINGS OF 17 B-SPACE VARIABLES

ON SEVEN BASIS DIMENSIONS

(2) 1963 ORIGINAL DATA

FACTORS	I TRADE	II FDIPL	III INDIP	IV ECAID	V NECOM	VI CONGO	VII VISIT
1 EXPOR	-86	-23	25	10	07	02	-02
2 IMPOR	-83	07	13	14	18	-28	01
3 ECAID	-06	-11	26	88	-06	-00	04
4 DIPFP	-07	-96	11	19	04	-05	09
5 DIPTP	-07	-96	12	18	05	-07	06
6 TREAT	-21	-28	79	16	-06	02	26
7 CONGO	-20	-12	16	-14	14	-08	-16
8 POFVT	-22	-36	20	64	-03	18	20
9 POFVF	02	-17	26	22	-01	18	86
10 PNOVF	-13	06	88	13	-01	-15	24
11 ECOVT	-29	-23	74	15	-01	13	-30
12 ECOVF	00	-06	94	16	-01	-10	-04
13 CULVT	-17	-22	66	56	-03	-08	21
14 CULVF	-13	-04	88	35	00	-03	16
15 CONCN	-06	-07	66	46	47	-05	09
16 POCOM	-10	-22	50	65	16	20	13
17 NECOM	-19	-06	-06	-04	95	-12	-03
% OF TOTAL VARIANCE	10.4	13.6	29.6	14.8	7.2	6.1	7.1

TABLE 7

LABELS OF SEVEN R-SPACE BASIS DIMENSIONS

FACTOR	FACTOR LABELS	FACTOR CODE	SIGNIFICANT VARIABLES
I	Trade	TRADE	EXPOR, IMPOR (.55: DPEAC, CULVT, SULVF, CONCH, POCOM)
II	Formal Diplomacy	FDIPL	DIPPP, DIPTP
III	Informal Diplomacy	INDIP	[illegible], [illegible], [illegible] (.55: TRLAT, CULVT, [illegible], CONCH, POCOM)
IV	Economic Aid	ECAID	ECAID (.63: POFVT, CULVT, POCOM)
V	Negative Communication	NECOM	NECOM
VI	NGO Co-Membership	CONGO	CONGO
VII	Political Visit	VISIT	POFVT

Again factor analysis was repeated three more times with three modified data sets--transformed data (T), reduced data (R), and reduced and transformed (RT)--to see the stability of the pattern structure of B-space. The results of the comparison are summarized in Table 10-1, and the loadings of the four data sets (the above three and the original data set) are presented side by side in Appendix II-B for easy cross-checking.

As we can see in Table 10-1, factor patterns were quite similar across the four data sets, except for the last two factors whose eigenvalues were so low (.50) that the variances were safely attributable to random error.

Unlike A-space, however, the factor patterns over time were not so stable. Although we could identify the same factors in both time spaces, the component variables of the first two factors were changed. In 1955, export, import, treaty, cultural visit to the object, cultural visit from the object, official concern, and positive communication loaded on the first factor, trade; and non-official political visit, economic visit to the object, and economic visit from the object loaded on the second factor, informal diplomacy (INDIP). In 1963, however, the last five variables of the first factor shifted to the second factor. This means that in 1955, for example, treaty signing, cultural interaction and political appraisal were deeply interrelated with trade, while in 1963, these activities were associated with informal diplomacy.

TABLE 10-1

B-SPACE FACTOR PATTERN STABILITY
AMONG DIFFERENT DATA SETS

FACTORS	1955			1963		
	T[a]	R	RT	T	R	RT
1 TRADE	.98[b]	1.00	.98	.96	1.00	.97
2 FDIPL	.97	.99	.97	1.00	1.00	1.00
3 INDIP	.99	.98	.97	.99	1.00	.99
4 ECAID	1.00	1.00	.99	.97	.97	.97
5 NECOM	1.00	1.00	.99	.99	.99	.99
6 CONGO	.98	.98	.98	.95	.95	.94
7 VISIT	1.00	.93	.92	.97	.97	.99
OVERALL[c] CORRELATION	.99	1.00	.99	.98	1.00	.99

[a]T = Transformed data (N = 81)
R = Reduced data (N = 55)
RT = Reduced and Transformed data (N = 55)

[b]Correlation between the loadings of the factor of the indicated data with the loadings of the corresponding factor of the original data.

[c]Correlation between all loadings of the indicated data and those of the original data. The correlation was calculated between the two super columns, each of which was formed by connecting all columns in the matrix into one long column.

One possible interpretation may be that China, at the beginning of her nationhood, was not fully prepared to launch a systemic diplomatic campaign. As a result, she did not "use" verbal communication (POCOM), for instance, as a tool of diplomacy. China simply traded with old friends (Communist countries) and praised old friends. Checking the factor scores, we can see that the nations high on this dimension are USR (8.47),[117] VTN (1.37), GME (1.05), POL (.47), KON (.42), CZE (.36), and YUG (.27), and this partly supports this interpretation. By 1963, however, China's foreign policy was well structured and the policy-makers could play diplomatic games utilizing all available resources. As a result, for example, China strategically praised a certain nation to lure her into China's orbit, or in other words, she could verbally praise or direct cultural visits to a nation to insure the success of her political penetration plan (INDIP represented by PNOVT).

In 1955, for instance, positive communication was highly correlated with import (.94)[118] and export (.94). This means that verbal praise was directed to old Communist friends with whom China traded most. In 1963, however, positive communication was poorly correlated with import (.21) and export (.36) on the one hand, while on the other hand it showed fairly high correlations with economic aid (.67), economic visit from the object (.58), cultural visit to the object (.77),

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[117]The figures are standardized factor scores.

[118]The figures are product-moment correlations.

cultural visit from the object (.69) and official concern (.75), which tells us that positive communication was linked to other penetration tools like cultural visits, economic aid and economic visits, etc.

In 1955, non-official political visit was not so much correlated with cultural visit to the object (.42) or cultural visit from the object (.46), while in 1963 it was strongly correlated with them (CULVT: .72, CULVF: .93), which again supports the hypothesis of systemized policy strategy of China in 1963.

As a whole, the informal diplomacy dimension of 1963 was different from that of 1955 in the sense that informal diplomacy represented by non-official political visit was reinforced by cultural visit to the object, cultural visit from the object, positive communication, etc. The factor scores on this dimension shows us to which nations China's informal diplomacy was oriented.[119] The nations high on the informal diplomacy (INDIP) dimension in 1963 were, in descending order, JAP (7.09),[120] KON (3.40), PAK (2.02), INS (1.37), VTN (1.13), BRA (1.07), RUM (.77), UNK (.61), ALB (.54), and CUB (.51).

Although several variables shifted from TRADE to INDIP in the 1963 space as we have just discussed, the overall factor structure of both spaces were quite similar. As we can see in Table 10-2, the overall correlations between the 1955 and the 1963 factor loadings

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[119]Later (in Chapter 9), this will be discussed in detail.

[120]The figures are standardized factor scores.

TABLE 10-2

B-SPACE FACTOR PATTERN STABILITY OVER TIME:
FACTOR COMPARISON BETWEEN 1955 AND 1963 SPACES

FACTORS	KINDS OF DATA[a]			
	O	T	R	RT
1 TRADE	.72[b]	.68	.70	.67
2 FDIPL	.98	.97	.97	.95
3 INDIP	.91	.86	.98	.97
4 ECAID	.97	.69	.96	.67
5 NECOM	.98	.96	.98	.97
6 CONGO	.85	.79	.80	.70
7 VISIT	.77	.58	.83	.76
OVERALL[c] CORRELATION	.91	.92	.90	.91

[a] O = Original Data (N = 81)
T = Transformed Data (N = 81)
R = Reduced Data Matrix (N = 55)
RT = Reduced and Transformed (N = 55)

[b] Correlation between corresponding factors in 1955 and 1963 spaces. Signs are ignored.

[c] Correlation between actual 1963 factor loadings (F_{63}) and the 1963 factor loadings estimated from 1955 factor loadings from the following equation,

$$\hat{F}_{63} = F_{55}L$$

where L is transformation matrix for least-square fit. Correlation was calculated between two super columns, each of which was formed by connecting all columns one after another, in the F_{63} and the $\hat{F}_{63}$ matrices, respectively.

were greater than .90 in all four sets of data.[121]

It is difficult to compare the factors of B-space with those of similar studies. In this study, all dyads have the same actor--China, and this means that we are dealing with only one nation's behavior pattern, while other studies include many actors and deal with the general pattern of nations' behavior. As mentioned earlier (5.2), a one-actor-behavior-space creates many problems such as restrictions on the selection of variables.[122] If the list of variables are completely different for the two studies, it is very difficult to compare the factor patterns.

The dimensions of B-space in this study, however, may be meaningfully compared to the ones delineated in a one-actor dyadic study done on U.S. foreign behavior by Rummel (Rummel, 1970b). Though the actors are different, there are many aspects to be compared: both studies shared many variables, the year of the analyses was the same (1955), and the population of the studies was the same (the same eighty-two nations).

The factors were matched one by one through the common high loading variables as shown in Table 11-1. As we can see in the table, we can identify four similar factors in the two studies: Trade↔Anglo-American cooperation, formal diplomacy↔cold war, negative communication

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[121]The correlations were calculated using Ahmavaara's transformation analysis technique. See Ahmavaara and Markkanen, 1958. See also footnote in the table.

[122]The sphere of interaction of a single nation is usually very restricted. Many variables such as military conflict, anti-government demonstrations, tourist, expulsion of diplomats were excluded because of low variance.

TABLE 11-1

B-SPACE FACTORS:

COMPARISON WITH RUMMEL'S STUDY ON USA[a]

FACTORS OF THIS STUDY	HIGH-LOADING VARIABLES			RUMMEL'S FACTORS
	LOADING	VARIABLE NAME	LOADING	
TRADE (Trade)	.97 .98 --	Exports Imports Exports of book	.93 -- .99	Anglo-American Cooperation
FDIPL (Formal Diplomacy)	.90 --	Diplomat sent to Peking Embassy or Legation	-- .69	Cold War
CONGO (Co-Membership of NGO)	.89	NGO Co-membership	--	None
NECOM (Negative Communication)	.99 --	Negative Communication Military Violence	.90 .94	Deterrence
INDIP (Informal Diplomacy)	.86	Non-Official Visit	--	None
ECAID (Economic Aid)	.96	Economic Aid	.91	Aid
VISIT (Official Political Visit)	.84	Official Political Visit	--	None
None	-- --	Students Conference	.84 .75	Western European Cooperation
None	--	Negative Sanction	.81	Negative Sanction

[a]Rummel, R. J. "U. S. Foreign Relations: Conflict, Cooperation and Attribute Distances," The Dimensionality of Nations Project, Research Report No. 41. Honolulu: University of Hawaii, 1970.

↔deterrence, economic aid↔aid. The most salient (in terms of variance accounted for) factor in Rummel's study--Western European Cooperation--, however, could not be matched with any in this study. This was because all the high loading variables on this factor were the ones omitted in this study.

From this comparison, we can find that a nation's cooperation behavior is independent of both formal diplomacy and conflict behavior, the implication of which will be discussed in detail later.

The factors of this study were also compared to those delineated from global studies.

As references, two of Rummel's works were chosen. The first one was "Field Theory and Indicators of International Behavior," in which Rummel tested field theory (both Model I and II) using 1955 data and a selected sample of 182 nation dyads. Since one of his aims with the work was to select indicators of such central concepts as cooperation, conflict, and transaction, he included all possible variables to cover every possible aspect of international relations between nations. Therefore, the dimensions delineated in that study may be assumed to be sufficiently general as a reference.[123]

Again, in terms of highly loaded variables, each of the seven factors in my study correspond to a factor in Rummel's study, as shown

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[123]Ten dimensions of nations' behavior were found in the study = salience, emigration and communication, UN voting, foreign students, export, international organizations, official conflict behavior, diplomatic representation, self-determination voting and anti-foreign demonstration. See Rummel, 1969b.

in Table II-2. The figures are the factor loadings of the variables on the dimension.

As we can see in the table, it was possible to match five out of the total seven factors of this study to corresponding ones in Rummel's study. The other two, economic aid (ECAID) and official political visits (VISIT), could not be matched, simply because Rummel did not include the variables related to these concepts.

The second global study compared to was "Field Theory and the 1963 Behavior Space of Nations" (Rummel, 1970c). This study was done with fifty-six variables for 182 dyads generated from fourteen selected sample nations using 1963 data.

Out of the sixteen orthogonal factors found in Rummel's study, six could be identified with six of the seven factors found in this study, by checking common high loading variables. The results of the comparison are given in Table II-3.

The high comparability of the factors in this study with those of global studies is significant, because it indicates that the foreign behavior of nations, though seemingly complicated, can be defined in terms of several common ingredients. The generality of the common basis of nations' behavior confirms axiom 3 of field theory and assures us of the applicability of field theory to one-actor dyadic study.

In subsequent analyses, the factor scores of the seven factors will be used as the measuring units of China's behavior toward other nations on that dimension. The scores are given in Appendix III-B.

TABLE 11-2

B-SPACE FACTORS: COMPARISON WITH RUMMEL'S GLOBAL STUDY, 1955[a]

FACTORS OF THIS STUDY	HIGH-LOADING VARIABLES			RUMMEL'S FACTORS
	LOADING	VARIABLE NAME	LOADING	
TRADE (Trade)	.97 .98	Exports Imports	.95 --	Export
FDIPL (Formal Diplomacy)	.90 .90 --	Diplomat sent to Peking Diplomat received by Peking (Relative embassy legation)	-- -- --	Diplomatic
CONGO (Co-Membership of NGO)	.89 -- --	NGO Relative IGO Relative NGO	.51 .86 .79	International Organization
NECOM (Negative Communication)	.99 --	Negative Communication Military Violence	.81 .81	Deterrence
INDIP (Informal Diplomacy)	.86 -- .65	Non-Official Political Visit Relative Mail Positive Communication	-- .90 --	Communication
ECAID (Economic Aid)	.96	Economic Aid	--	None
VISIT (Official Political Visit)	.84	Official Political Visit	--	None

[a]R. J. Rummel. "Field Theory and Indicators of International Behavior." The Dimensionality of Nations Project, Research Report No. 29. Honolulu: University of Hawaii, 1969. The factor analysis was done for 182 dyads generated from fourteen selected nations.

TABLE 11-3

B-SPACE FACTORS: COMPARISON WITH RUMMEL'S GLOBAL STUDY, 1963[a]

FACTORS OF THIS STUDY	HIGH-LOADING VARIABLES			RUMMEL'S FACTORS
	LOADING	VARIABLE NAME	LOADING	
TRADE (Trade)	.86	Exports	.83	Salience
	--	Books	.87	
	--	Tourists	.87	
FDIPL (Formal Diplomacy)	.96	Diplomat sent to Peking	--	Diplomatic
	--	Relative Embassy	.90	
CONGO (Co-Membership of NGO)	.88	NGO Co-Membership	.88	International Organization
	--	Relative IGO	.86	
NECOM (Negative Communication)	.95	Negative Communication	.86	Deterrence I
	--	Total Conflict	.87	
INDIP (Informal Diplomacy)	.79	Treaty	--	None
ECAID (Economic Aid)	.88	Aid	.93	Aid
	--	Relative Treaty	.95	
VISIT (Official Political Visit)	.86	Visits	.73	Students
	--	Students	.86	

[a]Rummel, R. J. "Field Theory and the 1963 Behavior Space of Nations." The Dimensionality of Nations Project, Research Report No. 44. Honolulu: University of Hawaii, 1970.

CHAPTER VIII

ASSESSMENT OF FIELD THEORY FOR CHINA'S BEHAVIOR

One of the basic propositions of field theory was that the sum of the attribute distance vectors works as a force to determine the dyadic behavior of the actor (see 3.2). In more rigorous terms, this says that there is a linear relationship between the basic dimensions of B-space and the attribute distances in A-space. And there were two different mathematical models--the Multiple Regression Model (MRM) and the Canonical Regression Model (CRM)--which represents the relationship between A- and B-spaces.

As discussed earlier in 4.1, the two models were tested with empirical data to determine fitness of the linear models to the data.

8.1 Test Result of the Multiple Regression Model

The equation of the "Multiple Regression Model" (MRM) was,

$$W_{mxq} = D_{mxp} P_{pxq} + U_{mxq} \qquad (10)$$

where W_{mxq} is the matrix of behavior space whose column vectors are the basis dimensions of B-space, D_{mxq} is the factor distance matrix

of the A-space,[124] P_{pxq} is the matrix of the regression coefficient and U_{mxq} is the residual matrix.

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[124]There have been several different interpretations of field theory concerning the "kind" of distances to be employed. For example, some have used Euclidean distances, where distance between nation i to j on ℓ-th attribute is calculated as

$$d_{i \to j, \ell} = \pm\sqrt{(b_\ell - a_\ell)^2}$$

where $d_{i \to j, \ell}$ is the distance on ℓ-th variable, a_ℓ and b_ℓ are scores of i and j on variable ℓ. Note that here we lost the "direction" of difference, since there are two square roots for one value (+ and -) and we do not know which to take. If there are more than two variables (*e.g.* ℓ, k) then the distance between i and j will be

$$d_{i \to j} = \pm\sqrt{(b_\ell - a_\ell)^2 + (b_k - a_k)^2 \ldots}$$

but in the original model of field theory, Rummel specified how to aggregate individual distances into one, stating that the aggregation should produce "the resolution" vector. Therefore, we cannot calculate the distances in this way.

Gleditsch (1969, pp. 12-3) once discussed four "permissible" interpretations of the distances. The four are 1) signed differences on attribute dimensions, 2) squared differences on attribute dimensions, 3) sums on attribute dimensions, and 4) squared sums on attribute dimensions. Among these, however, No. 3 and No. 4 are obviously not "distances" and should be excluded. The "squared differences" (No.2) is also not desirable for the following two reasons: First, "squared distances" do not fit the original meaning of "distance," since it cannot discriminate the position of i from the position of j in the field. The "distance" is a quantity that defines the position of point i relative to other points in the field. It is the relative position which is defined by both direction and magnitude, not only the magnitude of the distances, that works as force. Second, there is no reason for substituting "squared differences" for "signed differences." The original argument for this substitution was basically grounded on the fact that with signed differences the behavior i→j should be the exact reverse of j→i which is unrealistic in the empirical world. But if we take Model II rather than Model I, this argument becomes pointless, since different weighting parameters for each nation actor will "adjust" this absurdity. As a conclusion, there is no alternative interpretation of the distances "permissible" within the context of field theory. I will retain the original interpretation of d as a distance vector and of D as comprising distance vectors.

First, each of the seven columns of W matrix was regressed on the fourteen columns of D to get the P matrix. Then, I calculated the predicted value of each case (dyad) on the same seven factors using the following equation

$$\hat{W} = DP \qquad (24)$$

where $\hat{W}$ is the calculated value for W. Residuals, U were obtained by subtracting $\hat{W}$ from W ($U = W - \hat{W}$). In order to see the overall linear fit between the two spaces, I calculated the product-moment correlation between W and $\hat{W}$. In order to see the sensitivity of the findings to the kind of data, the same analysis was done for all four parallel sets of data (O, T, R, and RT). Since the $\hat{W}$ and U matrices are too big to be printed, only the product-moment correlations between W and $\hat{W}$ appear in Table 12.

As we see in the table all the correlations were converged around .70, which means that about 50 percent of the variance is contained in the linear fit. Whether to accept this figure as satisfactory is a difficult decision because there is no objective standard. Considering possible error in the data collection and the arbitrariness in selecting variables, however, the fifty percent figure is relatively high and can serve as strong supporting evidence for the proposed linear relationship between attribute distances and behavior of nations.

TABLE 12

TEST RESULT OF MULTIPLE REGRESSION MODEL:
CORRELATION BETWEEN PREDICTED AND OBSERVED BEHAVIOR

TYPE[a] OF DATA	1955		1963	
	r[b]	r^2	r	r^2
O	.713	.508	.704	.496
T	.689	.463	.631	.398
R	.728	.527	.725	.526
RT	.705	.497	.665	.442

[a] O = Original data (81 dyads)
T = Transformed data (squareroot transformation) (81 dyads)
R = Reduced data (55 dyads)
RT = Reduced and Transformed data (55 dyads)

[b] Correlations were calculated between the predicted scores, $\hat{W}$ (= DP), and the observed scores, W. A super column was formed from each matrix into one long column, and, then, a product-moment correlation between the two super columns was calculated.

8.2 Test Results of the Canonical Regression Model

As discussed in 4.1.1, and 3.4.3, my major concern is the CRM. The mathematical model of the CRM was,

$$W_{mxq} Q_{qxq} = D_{mxp} P_{pxq} + U_{mxq} \qquad (18)$$

where W_{mxq} is the matrix of seven column vectors of the basis dimensions of B-space, Q_{qxq} is the matrix of canonical regression weights of the columns of the W_{mxq} matrix (China's behavioral framework), D_{mxp} is the matrix of the factor score distance vectors of the fourteen basis dimensions of A-space, P_{pxq} is the matrix of canonical regression coefficients which weight each of the columns of A-space matrix (China's perceptual framework), and U_{mxq} is the residual matrix (WQ - DP).

Again, canonical regression analyses were done on all the four data sets; the results are presented in Table 13. In order to measure the overall fit between A- and B-space, the trace correlations (the average of seven canonical correlations) were calculated. Table 14 shows the trace correlations for the four data sets for both 1955 and 1963.

As shown by the r^2 in Table 14, the result indicates that approximately 55 percent of the total variance in the spaces was accounted for by the model. Although the figures are not quite satisfactory, they still support linear relationship between A- and B-spaces

TABLE 13

TEST RESULTS OF CANONICAL REGRESSION MODEL[a] (1)

(1) 1955 DATA

KIND OF DATA[b]	ORDER[c]	PROPORTION OF TOTAL VARIANCE[d]	r[e]	λ[f]	χ^2[g]	d.f.[h]	Z[i] d.f.≥30	σ[j]
O	1	9.5	.991	.000	659.4	98	22.3	0.13
	2	9.5	.954	.005	374.7	78	14.9	0.30
	3	10.1	.869	.053	205.9	60	9.4	0.51
	4	10.1	.729	.216	107.4	44	5.3	0.73
	5	9.0	.580	.460	54.4	30	2.7	0.91
	6	9.1	.441	.693	25.7	18	1.3	1.05
	7	9.5	.374	.860	10.5	8	0.7	1.11
T	1	9.5	.960	.001	493.8	98	17.5	0.28
	2	9.8	.923	.010	316.2	78	12.7	0.39
	3	10.2	.855	.074	182.7	60	8.2	0.53
	4	9.4	.715	.274	90.7	44	4.1	0.75
	5	9.6	.548	.560	40.6	30	1.3	0.94
	6	8.8	.373	.800	15.6	18	-0.3	1.11
	7	9.3	.266	.929	5.1	8	-0.7	1.20
R	1	9.5	.988	.000	435.7	98	15.6	0.15
	2	9.5	.968	.002	270.2	78	10.8	0.25
	3	10.2	.899	.034	148.6	60	6.3	0.45
	4	10.1	.792	.178	75.9	44	3.0	0.64
	5	8.5	.541	.478	32.5	30	0.4	0.95
	6	9.4	.455	.675	17.3	18	-0.0	1.03
	7	9.5	.385	.852	7.1	8	-0.1	1.10
RT	1	9.2	.966	.000	346.7	98	12.4	0.26
	2	10.0	.945	.006	227.5	78	8.9	0.33
	3	10.3	.893	.053	129.3	60	5.2	0.46
	4	9.4	.741	.261	59.1	44	1.5	0.71
	5	9.5	.489	.579	24.1	30	-0.7	1.00
	6	8.8	.390	.760	12.0	18	-1.0	1.09
	7	9.5	.322	.897	4.8	8	-0.8	1.15

(CONTINUED)

TABLE 13

(Continued)

TEST RESULTS OF CANONICAL REGRESSION MODEL[a] (2)

(2) 1963 DATA

KIND OF DATA[b]	ORDER[c]	PROPORTION OF TOTAL VARIANCE[d]	r[e]	λ[f]	χ^{2}[g]	d.f.[h]	Z[i] d.f.≥30	σ[j]
O	1	9.4	.968	.000	535.8	98	18.8	0.25
	2	9.6	.921	.007	343.0	78	13.7	0.40
	3	9.5	.858	.049	211.4	60	9.7	0.53
	4	9.3	.845	.186	117.9	44	6.0	0.55
	5	9.9	.445	.648	30.3	30	0.1	1.05
	6	9.6	.396	.808	14.9	18	-0.5	1.09
	7	9.7	.203	.959	3.0	8	-1.4	1.25
T	1	9.5	.961	.003	419.2	98	15.0	0.28
	2	9.6	.882	.032	240.1	78	9.5	0.48
	3	9.3	.798	.146	134.6	60	5.5	0.63
	4	8.9	.592	.403	63.7	44	2.0	0.90
	5	9.6	.470	.620	33.4	30	0.5	1.02
	6	9.6	.376	.796	15.9	18	-0.3	1.11
	7	9.6	.269	.928	5.3	8	-0.6	1.20
R	1	9.4	.965	.000	362.2	98	13.0	0.26
	2	9.6	.936	.004	244.5	78	9.7	0.35
	3	9.2	.904	.031	152.5	60	6.6	0.43
	4	9.6	.825	.171	77.7	44	3.1	0.59
	5	9.5	.514	.536	27.5	30	-0.3	0.98
	6	9.4	.469	.729	13.9	18	-0.6	1.02
	7	9.1	.257	.934	3.0	8	-1.4	1.21
RT	1	9.6	.961	.001	301.1	98	10.6	0.28
	2	9.5	.929	.014	187.5	78	6.9	0.37
	3	9.6	.837	.103	99.9	60	3.2	0.57
	4	8.6	.609	.345	46.8	44	0.3	0.88
	5	9.6	.472	.549	26.4	30	-0.4	1.02
	6	9.4	.436	.707	15.3	18	-0.4	1.05
	7	9.8	.357	.873	6.0	8	-0.4	1.12

(CONTINUED)

TABLE 13

(Continued)

TEST RESULTS OF CANONICAL REGRESSION MODEL (3)

(3) FOOTNOTES

[a]For detailed explanation of each statistic given, see Rummel, 1970b, pp. 89-90, Appendix IV, and Van Atta and Rummel, 1970, p. 23.

[b]The symbols represent the following:

O = Original data (N = 81)
T = Transformed data (N = 81)
R = Reduced data (N = 55)
RT = Reduced and transformed data (N = 55)

[c]Order of canonical variate pairs, *e.g.* 1: first canonical variates, 2: second canonical variates, and so on.

[d]The proportion of total variance in the variables accounted for by each of the pairs of the canonical variates.

[e]r = canonical correlations, the correlation between A- and B-spaces.

[f]The formula for λ is

$$\lambda = \prod_{k=1}^{q} (1-r_k^2)$$

where q is the number of canonical correlations, r_k is the k-th correlation.

[g]Chi-square equals $-\{n-0.5(p+q+1)\}\log_e \lambda$

where n = the number of cases (dyads), q = the number of behavioral dimensions (= 7), and p = the number of attribute dimensions (distances; = 14).

[h]d.f. = degrees of freedom

$$d.f. = \{p-(k-1)\}\{q-(k-1)\}$$

[i]Corresponding areas under the normal curve.

[j]Standard deviation (error) of residuals in equation 18. The residual, U = WQ - DP.

TABLE 14

TRACE CORRELATIONS OF CANONICAL ANALYSES

1955 AND 1963

KINDS OF[a] DATA	1955		1963	
	r	r^2	r	r^2
O	.74	.55	.72	.52
T	.71	.50	.67	.45
R	.76	.58	.74	.55
RT	.72	.52	.70	.49

[a] O = Original Data (N = 81)
T = Transformed Data (N = 81)
R = Reduced Data Matrix (N = 55)
RT = Reduced and Transformed (N = 55)

in field theory.[125] Some possible reasons for the 45 percent unpredicted variance are: 1) too many "zero" cells in the behavior data matrix, 2) the limited number of variables, and 3) incorrect information. Comparing the trace correlations of the original data (O) to those of the reduced data set (R), we can see a slight increase (3%) in the latter. This seems to indicate that 1) holds. There is no evidence at this moment, however, for 2) and 3). Only after the analysis is redone with more variables and better data, can the results be compared.

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[125]The findings here are almost comparable to the findings of Rummel's two previous studies: For the China study (Rummel, 1969b), the trace was .77, the first canonical correlation was .97 and the second canonical correlation was .85; for the U.S. study (Rummel, 1970b), the trace r = .68, 1st r = .94, 2nd r = .82. But the findings of this study are much better than the ones in the 1963 China study (Van Atta and Rummel, 1970): the trace r of Van Atta and Rummel's was .61, the first canonical r was .91 and the second canonical r was .45.

CHAPTER IX

PATTERNS OF CHINA'S FOREIGN BEHAVIOR

In Chapter VIII, the empirical test of field theory was discussed. The results confirmed the linear relations between behavior space and attribute distance space proposed by field theory and showed sufficient evidence for the applicability of the model for some restricted purposes[126] such as the delineation of the inner structure of the behavior-attribute distance linkage patterns. In this chapter, I will discuss the patterns of China's foreign behavior delineated by the canonical analysis (CRM).

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[126]The results were not completely satisfactory in the sense that the model, in its current form and tested with obtainable data, is not accurate enough to be used by policy makers to forecast real behavior. There is no general standard for determining the practical applicability of a behavior model. Different purposes may require different degrees of accuracy of prediction of the model. As we have seen in the previous chapter, the model, in general, accounts for more than fifty percent of the variance in behavior space. For example, in determining what attribute distances are important in explaining China's negative communication toward the object nations, the model which accounts for more than half of the total variance of negative communication behavior is acceptable.

But if the practitioner wants to use the model to estimate the amount of China's trade with a certain object nation, greater accuracy is required. Thus, I concluded that the model is inadequate for practical prediction. For practical forecasting, the standard deviation of error (real value minus estimated value) must be less than twenty percent of that of original variables. The detailed results of forecasting with the model will be discussed in Chapter X.

The canonical regression delineated seven patterns of China's foreign behavior. As discussed in 4.4, canonical analysis provides structure equations that relate a set of behavior variables (here, the basis dimensions of B-space) to a set of attribute distances (the basis dimensions A-space) in the form of linear combinations where the weighting coefficients are the partial correlations of the variables with the canonical variate scores.[127]

Since the coefficients (loadings), when squared, tell us the contributions of individual dimensional variables in constituting canonical variates, we can see the pattern structure of China's foreign behavior, *i.e.*, which distances are related to which behavior.

The form of the structure equation looks like the following:

$$b_{1h}W^1 + b_{2h}W^2 + \ldots + b_{kh}W^k + \ldots b_{qh}W^q \rightarrow a_{1g}D^1 + a_{2g}D^2 + \ldots + a_{\ell g}D^\ell + a_{pg}D^p \qquad (20)$$

where b_{kh} is the loading of the k-th factor of W (W^k) on the h-th canonical variate of B-space and $a_{\ell g}$ is the loading of the ℓ-th factor of D (D^ℓ) on the g-th canonical variate of A-space. The arrow means "relatedness" between the two combinations.[128]

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[127]Since the factors are almost orthogonal to each other in both A- and B-spaces and the scores are standardized, canonical regression coefficients are almost the same as the loadings.

[128]For a more detailed explanation of the canonical structure equation, see 4.4.

Out of the seven behavioral patterns of China found in the canonical regression analysis, the first five had canonical correlations which were statistically significant at the .01 level.[129] The sixth pattern had a correlation significant at the .10 and the seventh, at the .25 level. But the corresponding 1963 analysis gave only four patterns whose canonical correlations were significant at the .05 level.

In this chapter, the first four behavioral patterns which had significant correlations at the .05 level in both years will be interpreted in the first three sections. The four to be discussed are power-interaction (the first equation), the cold war (the second equation), the formal diplomacy (the third equation) and the behavior pattern related to international organizations (the fourth equation).

Of the three remaining patterns, the first two--informal diplomacy (the fifth equation) and economic penetration behavior (the sixth equation)--will also be discussed in the latter two sections. Not only were they significant in the 1955 analysis (though non-significant in 1963), they also repeatedly appeared in the studies with all other modified data sets. Therefore, they are also to be meaningfully discussed, in the sense that the patterns, at least, will give us some general feeling about China's behavioral patterns.

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[129]The Z value of the fifth canonical correlation with 30 degrees of freedom was 2.7, and corresponding P (Z > 2.457) = 0.01. For other Z values, see Table 13.

9.1 Power Interaction Pattern of China

The first behavioral pattern of China found in the canonical regression analysis mainly comprised two behavioral basis factors: negative communication and trade activities. The form of the relations between the two behavioral factors in the pattern was "additive": the two factors had the same positive signs.

The pattern in the form of the structure equation[130] delineated with the 1955 original data was

$$88\ \text{NECOM} + 46\ \text{TRADE} + 97\ \text{POWER} \quad (r = .99)^{131} \qquad (25)$$

This equation shows us that approximately seventy-seven percent of the variance in negative communication behavior (NECOM) and eleven percent in trade activities (TRADE) are explained mainly by one attribute distance--power disparity. The equation tells us that the amount of "joint" behavior of China's negative communication and trade directed to an object nation is a function of the power distance of the

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[130]The signs of the coefficients are "adjusted" to make the interpretation easier. The signs of factor scores have only a "relative" meaning within the factor, *i.e.*, the figure with the negative sign (-) is on one side of the zero point on the continuum. The signs, therefore, are not "absolute." The scores of the same factor may reverse signs from one analysis to another, for example, if the number of the factors to be rotated changes, or if a different algorithm (MESA or MODULAR) is applied. Depending upon the signs of the original factor scores, the signs in the canonical structure equation change. In this study, the signs are "adjusted" to be meaningful.

[131]The figure in the parentheses is the canonical correlation for the equation when all variables (including the one omitted due to low loadings) are included in the equation.

nation from China. Verbally, this means that the more powerful[132] the object nation, the more hostile China's communication, with more trade[133] between the two nations.

It is worthwhile to note that by the "joint" behavior of NECOM and TRADE, I do not imply that the two behavior scores vary together (covary). The two factors are mutually independent, and the correlation between them is almost zero. The positive parameters of the behavior vectors in the above equation tell us that the pattern comprises the two behaviors together in a positive way. The relation of the behavioral pattern and its component vectors can be geometrically illustrated as in Figure 4.

As we discussed in Chapter III, the canonical regression model of field theory delineates sets of mutually independent behavioral patterns, each of which is expressed in the form of a linear combination of the B-space basis dimensions. The above pattern, expressed as a linear combination of NECOM and TRADE is one of those found in the canonical regression analysis.

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[132]The independent variables are in terms of "difference" in factor scores. By difference we mean the score of the object minus China's score (signs retained) and not the "absolute" distance (see footnote 124). In 1955, China's score on POWER dimension was close to the mean value (in 1963, it was one standard deviation above the mean). Therefore, the POWER scores in this equation may be loosely interpreted as if they were "absolute" scores on the power scale. China's rank, however, is far above the center, since the mean value, itself, shifted to "powerful" direction because of several extreme cases such as USA (7.4 standard deviation high) and USR (4.2 standard deviation high).

[133]As indicated by the low coefficient of TRADE (.46) in the equation, its contribution to the canonical variate score is small (21%). As will be discussed later (see 9.2) trade behavior is mainly explained by political orientation, rather than power disparity.

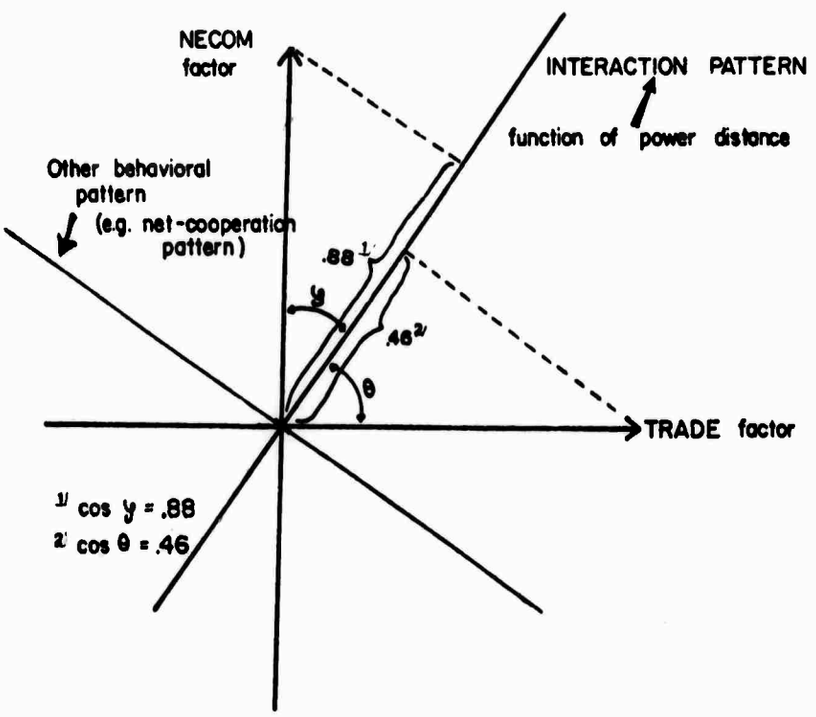

FIGURE 4

RELATIONSHIP BETWEEN BEHAVIOR PATTERN
AND ITS COMPONENT BEHAVIOR VECTORS

The pattern is composed of both conflict behavior (NECOM) and cooperation (TRADE) together and is mostly explained by the power disparity between China and the object nation. This pattern, therefore, depicts only the intensity of interaction disregarding whether the behavior is conflictful or cooperative. Since the explaining variable is power distance, and the pattern was neutral to the quality of the behavior, the pattern is named "power interaction pattern." The canonical correlation for this structure equation is .99. This means that nearly all of the joint behavior of China's negative communication and trade (NECOM + TRADE) can be explained by power disparity (to the amount of 99 percent of the variance). Applying this equation, we can calculate a set of estimates of behavior scores for the combination of NECOM and TRADE, the interaction pattern scores (intensity of interaction) for each object nation from power disparity. Figure 5 plots the estimates of this behavior combination from power disparity. In the plot, as expected from the high canonical correlation (.99), the dyads are aligned fairly close to the 45 degree line (perfect prediction line). From the plot we can see that such a high correlation as .99 was due mainly to two extreme dyads, CHN→USA and CHN→USR. Even after eliminating the two dyads, however, the plots still show a satisfactory alignment.

In order to see the direct relationship between POWER and NECOM (without TRADE contamination) the factor scores of NECOM was directly plotted against POWER in Figure 6. Comparing Figure 5 to Figure 6, we can see clearly that the high value of USA on the Y axis in Figure 5 was mainly due to the high NECOM score, while that of USR was the

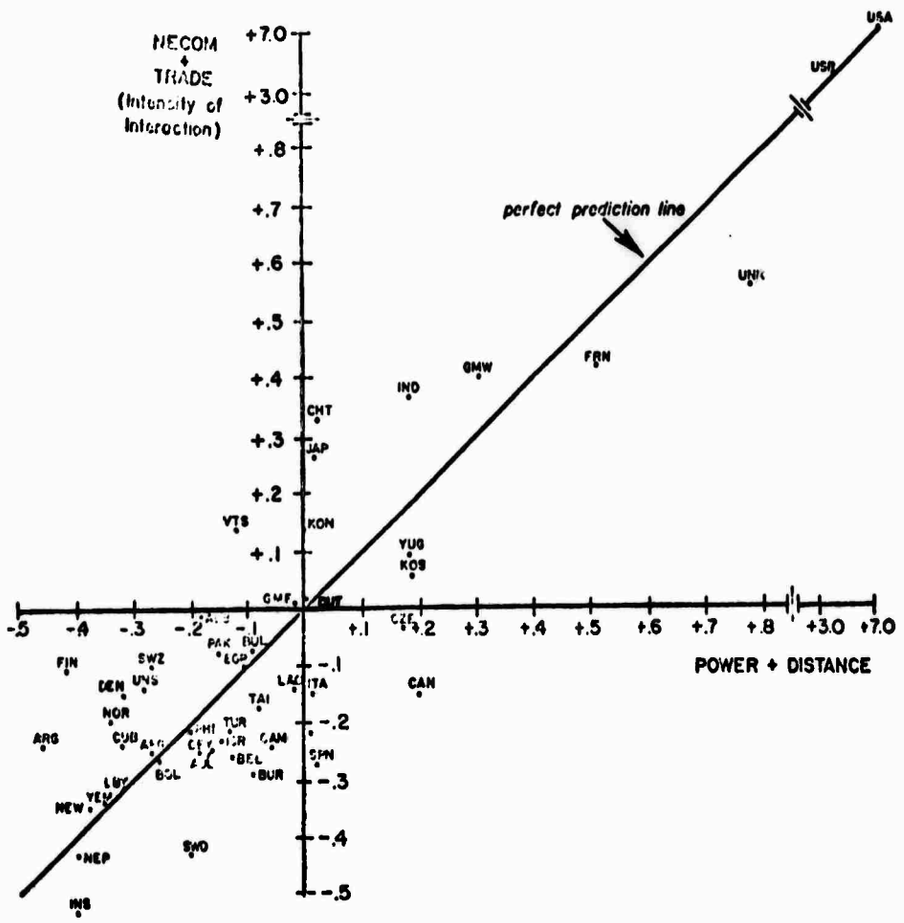

FIGURE 5

CHINA'S JOINT BEHAVIOR OF NECOM + TRADE, 1955

(canonical variate scores)

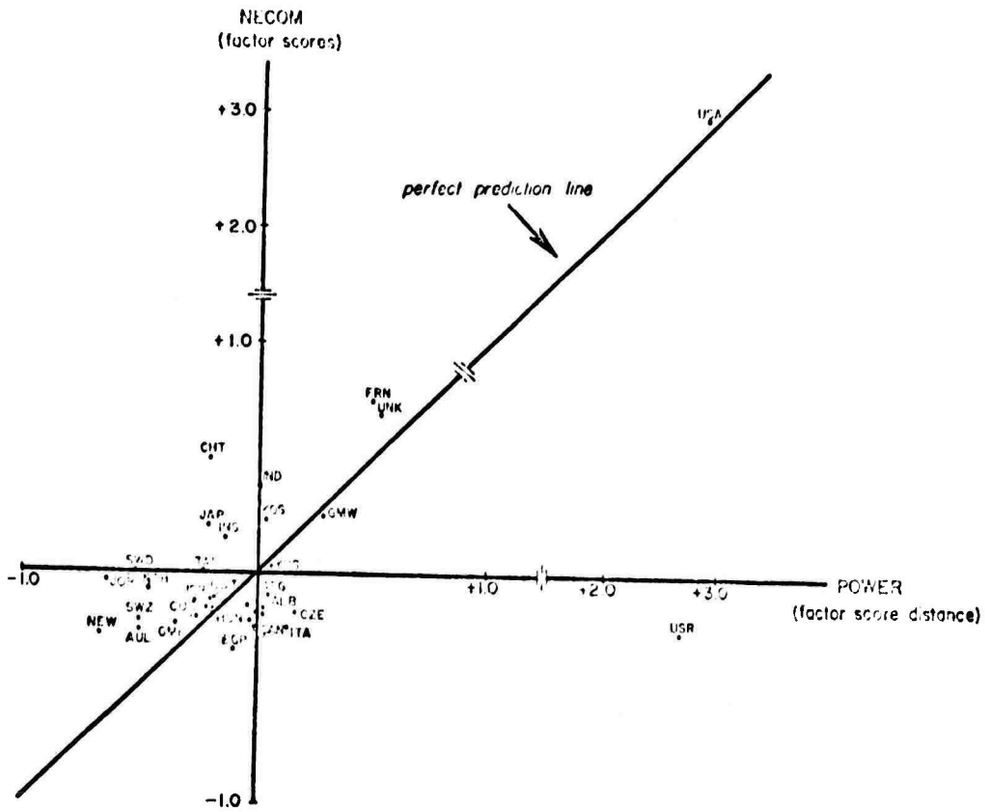

FIGURE 6
CHINA'S NECOM VS. POWER DISTANCE, 1955
(factor scores)

effect of high trade. In Figure 6, the dyads also roughly aligned along the perfect prediction line. This shows us that the pattern delineated shows the functional relationship between China's verbal hostility and the power of the object nation.

To see the effect of the modification of the data on the delineated behavioral pattern, the corresponding structure equations resulted from all four data sets--original (O), transformed (T), reduced (R) and reduced and transformed (RT)--are presented in Table 15. Comparing the four equations, we can see some significant changes in the loadings from one equation to another, although the basic pattern relationships are similar.

The difference between the loadings of the original data and the transformed data especially was noticeable. The variate scores of each output indicated that the changes were mainly due to the extreme values of USA and USR on NECOM and POWER. By reducing these values so that they are closer to the main group of objects by transformations, the effect of "big variance" on NECOM and POWER were "tamed." The contribution of TRADE, then, was increased relatively and the hidden contribution of political orientation (PORIE) in A-space emerged. For example, the same canonical relation of POWER↔NECOM linkage in T-55 study came out as the following:

$$58\ \text{NECOM} + 75\ \text{TRADE} + 80\ \text{POWER} - 43\ \text{PORIE} \quad (r = .96) \qquad (26)$$

Comparing this equation (26) to the previous one (25), we need to change the verbal interpretation slightly: the more powerful the object nation is and the more it is oriented politically toward the

TABLE 15

CANONICAL STRUCTURE EQUATIONS

FOR CHINA'S INTERACTION BEHAVIOR (NECOM + TRADE)[a]

FACTORS		BEHAVIOR FACTORS							ATTRIBUTE DISTANCES													r[c]
		TRADE[b]	FDIPL	INDIP	ECAID	NECOM	COMCO	VISIT	POWER	PORIE	DEVEL	WESTC	URAID	ACRIC	ORIEN	DIVER	WELFA	POSTA	CTRAD	COLON	FCONF	USAID	
1955	O[d]	-46[e]				88			97													.99
	T	75				58			80	43												.96
	R	-50				-86			-96													.99
	RT		44			84			-79	-47			35									.95
1963	O	-64				68			-80													.97
	T	63				-55	-49		79		-46											.96
	R	-54				78			82												33	.97
	RT	-59				-52	-56		77		-47											.96

[a] For computation, Charles Wall's *CANONICAL* program was used.

[b] These are factor label codes.

[c] Canonical correlations. All correlations are significant at the .0005 level.

[d] O = Original data (81 dyads), T = Transformed data (81 dyads), R = Reduced data (55 dyads), RT = Reduced and Transformed data (55 dyads).

[e] Only loadings that exceed .30 are given in the table. Signs are as appeared in the original computer outputs. Decimal points are removed.

non-Communist bloc, the more China tends to trade with the object and to direct more negative communication to the object.

The pattern was stable across time. The corresponding structure equation in the 1963 analysis was

$$68\ \text{NECOM} + 64\ \text{TRADE} + 80\ \text{POWER} \qquad (r = .97) \qquad (27)$$

Comparing the equation with the one for 1955 (equation 25), the pattern was the same, although the loadings were slightly changed and the canonical correlation dropped from .99 to .97. Considering the crudeness in the current data collecting procedure, the pattern is sufficiently stable across time. In Figure 7, the value of the behavioral variate of equation 27 was plotted against the value of the distance variate score for all dyads. Again as can be seen in the figure, the dyads aligned fairly well along the 45 degree line.

The finding of the strong linkage between NECOM and POWER exactly coincided with the findings of Rummel's previous work (Rummel, 1969b). Rummel's corresponding finding with 1955 data was, in terms of the structural equation,

$$100\ \text{Conflict} + -75\ \text{National Income} \qquad (r = .97) \qquad (28\text{-a})$$

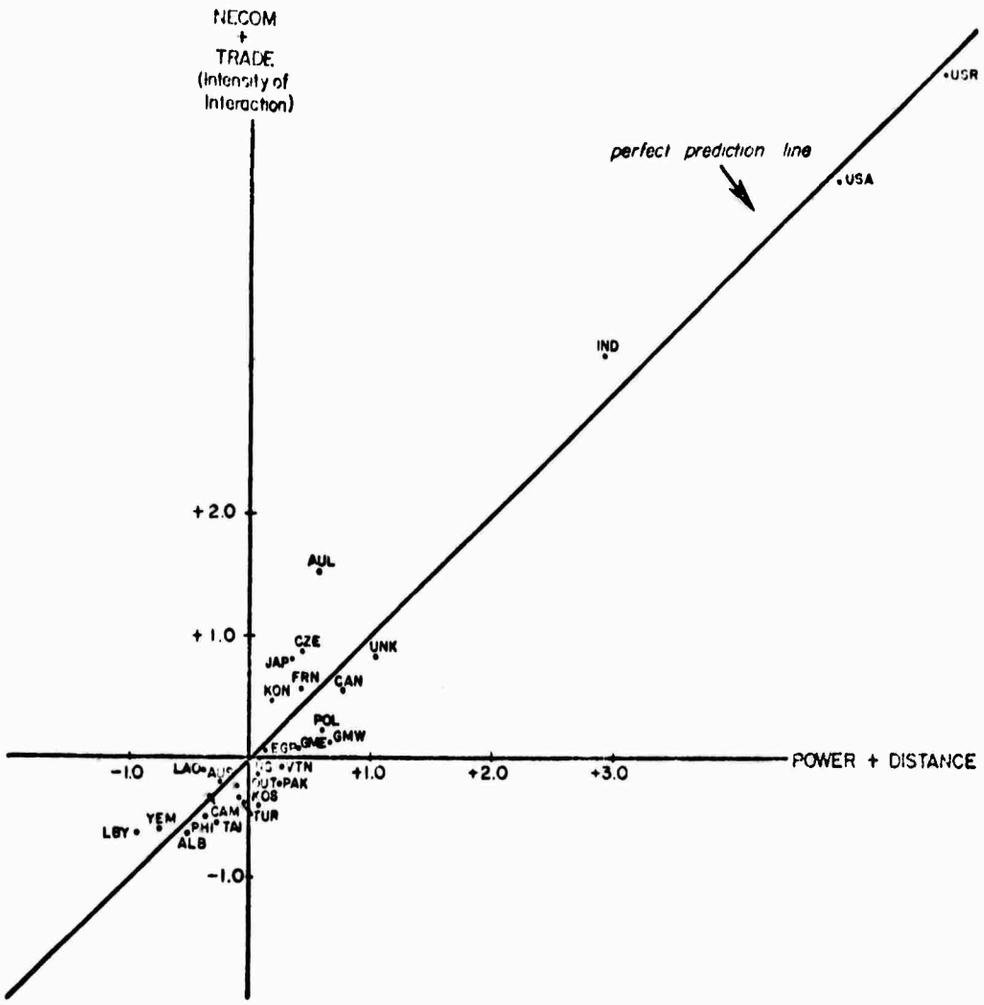

FIGURE 7
CHINA'S JOINT BEHAVIOR OF NECOM + TRADE, 1963
(canonical variate scores)

where the power disparity was measured in terms of distance in national income and the conflict may be regarded as the equivalent of NECOM of this study.[134]

Another similar finding was reported by Rummel in his recent study on U.S. foreign relations (Rummel, 1970b, pp. 54-5). The finding in the form of the structure equation was

$$81\ WE + 66\ DE \leftarrow -81\ PO \quad (r = .94) \qquad (28\text{-}b)$$

where WE means Western European behavior (cooperative), DE stands for the deterrence pattern (conflict), and PO is the power distance vector. Although the term TRADE in equation 25 of this study is somewhat different from WE of 28-b, one thing is very similar between the two findings: both are "conflict + cooperation ← power" type patterns.

It is also meaningful to compare the findings to some of the existing relevant theories. First, let us compare our results with

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[134]Note that "National Income" in the equation has a minus sign, while in equations 25-27 "POWER" has a plus sign. Although the results look different, in fact, the relations are similar, because in Rummel's study, the distance between the actor (U.S.) and the object was calculated as

$$a_{China} - a_{object},$$

while in this study the distance was calculated as

$$a_{object} - a_{China}.$$

The findings were similar for the 1963 data (Van Atta and Rummel, 1970). But this time instead of power distance (-.53), difference in political orientation (.84) appeared as the leading explanatory attribute distance. This result is similar to equation 26 above.

some of the propositions of the status theory.[135] Rummel combined two separate propositions[136] of Galtung's status theory as follows: "the distance of the object nation from U.S. (the actor) on power will contribute negatively to the joint cooperative and conflictual actions of the U.S. (the actor) toward that nation." In the form of the structure equation, this proposition was expressed as

$$gCO + hCF = -PB + k \qquad (29)$$

where CO denoted the cooperative acts of the U.S. (the actor) toward an object nation, CF conflict, and PB distance on power bases. In other words, this equation says that "the joint amount of conflict and cooperative actions toward an object should depend on the power parity of the two nations" (Rummel, 1970b).

Considering that the U.S. is the most powerful nation, and that, therefore, distance from the U.S. on power bases means less power, we can interpret the statement for China as the following: "the more

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[135]Lagos, 1963; Galtung, 1966. For the propositions of status theory, see Rummel, 1970b, pp. 27-35.

[136]One was for cooperative behavior, and the other for conflict behavior. They were, in Rummel's modified expression, 1) "the distance of object nation from the actor on economic development and power bases dimensions of attribute space will contribute negatively to the relative cooperative actions of the actor toward that nation," and 2) "the distance of the object nation from the actor on economic development will contribute positively and the distance on power bases will contribute negatively to the relative conflict actions of the actor toward that nation." (Rummel, 1970b, pp. 32-33. "U.S." was replaced with "the actor" by me).

powerful the object nation is, the greater the joint amount of conflict and cooperative actions toward the object nation becomes." If we compare this statement with the findings in this study,[137] we can see that the two statements are the same. We, therefore, can conclude that the findings of this study strongly support this part of status theory.

At this point, however, we need to note that the confirmation is for the proposition of status theory which was reconstructed by Rummel and not the original propositions. For example, the propositions of cooperative behavior alone says that "equal status (power parity--for U.S. this means other Powers, while for China it means other middle powers) leads to high cooperation," which was obviously not the case for China.

This inconsistency comes from the fact that the meaning of parity of power differs from actor to actor depending upon the location of that actor on the power hierarchy: If the actor is the most powerful, the parity means "equally powerful"; if the actor is at the bottom of the hierarchy, then the same parity means "equally weak"; and if the actor is in the middle, it means "moderately powerful," and therefore, the disparity means both "more powerful" and "less powerful" simultaneously. In status theory, if we interpret the term disparity generally (as the third occasion in the above illustration), then, the proposition on conflict based on power parity was clearly derogated by the findings of this study.

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[137]If we can assume that the TRADE scores in this study measure the cooperative behavior of one nation toward the object nation.

For China's case, for example, if status theory is correct, then, the dyads must align along the V shape prediction line consisting of two 45 degree lines meeting at the origin of the axes, because disparity means both "more powerful" and "less powerful." As we can see in Figure 4, the dyads lay along a straight line, and did not support the notion. The finding supported only half of the proposition: "the power disparity on the positive side causes conflict." On the negative side of the power dimension, the result was the opposite: "The weaker the object nation is, the less NECOM and TRADE."

Currently, however, one important theorem is being developed by Rummel on this linkage of power distance and conflict. In his status-field theory[138] Rummel theorizes that the status dependent cooperation (CO) and conflict (CF) behavior of one nation toward another is a function of both the difference in economic development (d_1) and power distances (d_2), which is expressed in the following equation:

$$CO + CF = (\alpha_1^* - \alpha_1)d_1 - (\alpha_2^* + \alpha_2)d_2 \qquad (29)$$

where α_1^* and α_2^* are cooperative parameters, and α_1 and α_2, conflict parameters.

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[138]Expressed in an unpublished draft printed in 1971. As I mentioned earlier, field theory is an abstract theory from which no specific theorem on real world political phenomena is deducible. In status-field theory, Rummel intends to subsume most of the major theorems of various status theories within the basic framework of field theory. This theory is still in the developing stage and the author has specified that no part of the draft paper be quoted without permission (Rummel, 1971).

Then, Rummel argues that 1) for economically developed nations, $(\alpha_1^* - \alpha_1)$ should be near zero while $(\alpha_2 + \alpha_2^*)$ is near unity; and 2) for economically underdeveloped nations, both α_2 and α_2^* are small (therefore, $\alpha_2 + \alpha_2^*$ becomes near zero) and α_1^* is high positive and α_1 is high negative (therefore, $\alpha_1^* - \alpha_1$ turns out to be a large positive figure). This means that for the economically developed nations, the joint behavior of cooperation and conflict is to be explained mostly by power parity, while for economically underdeveloped nations, the same behavior is explained mostly by their difference in economic development.

With this new theoretical perspective, let us examine the findings of this study again.

China was a moderately developed nation. Her rank on the economic development dimension was slightly above the midpoint in both years. Therefore, in explaining China's joint behavior of cooperation and conflict (intensity of interaction), both the difference in economic development and power parity are expected to play roles. China, however, was a high power nation (on power dimension, her rank was ninth in 1955 and third in 1963). Thus, for China, the total sum of d_2 (power distance) for all nations should be larger than that of d_1 (difference in economic development) in equation 29. Therefore, the empirical pattern is to give more weight on power distance than on the difference in economic development. The finding of this study (equations 25-27) empirically confirms this logical deduction by showing high weights on power distance. Furthermore, with this new theoretical framework of status-field theory with its dual explanatory distances

(power and economic development), we can solve the inconsistency problem of the original status theory discussed above: power parity explains conflict only among the high powers. As mentioned above, China was a high power nation. Thus, China's intensity of interaction (CO + CF) toward other economically developed powers should be very intense, because for those powers, d_2 are very small and d_1 is moderately large with large α_1^* and small α_1. As we can see in Figures 5 and 7, the findings of this study strongly support this argument. China's trade activities and negative communication toward USR, USA, UNK, CAN, and FRN were very intense.

Following the same logic, from equation 29, we can expect China's interaction with the non-power nations which are also underdeveloped to be very low, because, d_2 will be large and d_1 is also moderately large, and together with d_1 effect (with negative correlation) and d_2 effect (with negative correlation), the total interaction score should be high negative (very low).

With nations which are highly developed and not powerful, such as AUL, CZE and JAP, Chinese interaction should be moderately more intense than estimated from the equations 25-27, because this time the effect of d_1 is relatively strong and, therefore, the scores should be greater than the ones estimated from power distance alone. This expectation was met by the findings in Figure 7: the dyads involving AUL, CZE and JAP have positions fairly above the 45 degree line.

As a whole, the cooperation-conflict theorem of status-field theory explains well why power parity well explains the intensity of

interaction for the dyads including high power object nations, but not for those including weak underdeveloped nations.

Although the status-field theory is based on status theory, the derived theorem on the linkage between conflict and power parity also subsumes the theorem of the power transition theory of Organski.[139] In the power transition theory, conflict is said to be very likely when a challenging new power (next to the dominant power) is approaching the old-guard power in power capability.

From the status-field theory view, this means that d_2 in equation 29 is very small (great power parity) and d_1 is large (the challenger is less developed and tries to pull her up to the level of the dominant power by gaining power). Thus, with large α_1^* and small α_1, the interaction should be intense, and as indicated by large α_1^*, the interaction is very conflictful. The finding, as I discussed above, was very supportive of this notion of conflict of the power transition theory: as seen in Figure 5 and 7, China→USA dyad, for example, shows intense interaction, while, in Figure 6, it was revealed that the interaction mainly consisted of conflict.

One more finding still needs some explanation: why both cooperation and conflict behavior together vary in the same direction instead of being inversely correlated? Apparently, cooperation and conflict seem to form a continuum, cooperation on one end and conflict on the other. But it was found in many empirical studies that these two

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[139]Organski (1968, p. 376): "...Thus, wars are most likely when there is an approaching balance of power between the dominant nation and a major challenger."

behaviors are mutually independent and do not form a continuum, or the two behaviors are not antipodes (Rummel, 1970b, p. 49). It has been further argued by Rummel that both of them are not behavior space dimensions, but both of them together load on one dimension which may be called cooperation-conflict dimension, or interaction dimension (See Figure 4).

The findings of this study (equations 25-27) strongly support the independence of cooperative and conflictful behavior. In all equations in this section, both NECOM and TRADE have high positive parameters, which means that they are not antipodes at all. The findings rather tell us that both NECOM and TRADE jointly form a pattern of behavior and are related to the power distances.

So far we have discussed China's interaction behavior pattern which comprises both negative communication and trade activities positively. To summarize: 1) China's negative communication behavior can be explained by the distance on the power dimension of the object nation from China; 2) If the power disparity is positive (more powerful than China), the negative communication value is proportional to the power distance, and if the power disparity is negative (weaker than China), then, the negative communication value is inversely proportional to the power distance; 3) trade (economic cooperation) is also largely explained by the power disparity and the degree of cooperation is proportional to the power capability of the object nations; and 4) conflict and cooperative behavior are not on the opposite ends of one continuum; they together form an interaction pattern.

9.2 Cold War Behavioral Pattern of China

The second behavioral pattern delineated by the canonical regression analysis with 1955 original data in a canonical structure form was

$$65\ \text{TRADE} + 53\ \text{FDIPL} - 35\ \text{NECOM} + 76\ \text{PORIE} + 37\ \text{FCONF} + 30\ \text{URAID} \qquad (r = .95) \tag{30}$$

which meant that China tended to trade more, to have more intense formal diplomatic relations and to have less hostile relations with the socialist camp which received aid from the Soviet Union.

The pattern was very salient in terms of variance tapped by the model: ninety percent of the total variance of the behavior ($r = .95$) was contained in the model.

The pattern, as the interaction pattern discussed in the previous section, also comprises both cooperative behavior (TRADE and FDIPL) and conflict behavior (NECOM) together. This time, however, the relations between the two kinds of behavioral factors within the pattern is "subtractive" (in interaction pattern, they were additive). This means that the overall pattern score is determined by the difference between the cooperation score and the conflict score. The pattern score here is what was called "net cooperation index" by Park (Park, 1969).

Considering that the behavior depicted by the pattern is net cooperation between China and the object, and that the pattern is mostly explained by the difference in political orientation of the object nation from China, the pattern is named "cold war behavioral

pattern." By "cold war" I do not necessarily mean only the ideological war between the socialist camp led by the Soviet Union and the Western World. I use the term more broadly so that it also includes China's ideological struggle for indisputable hegemony in world politics, challenging both Western and Soviet dominance.

With this in mind, let us examine the development of the pattern over time. The corresponding cold war pattern, *i.e.*, cooperation (TRADE) - conflict (NECOM) pattern, took the following structure equation form with the original 1963 data.

$$67\ \text{TRADE} - 66\ \text{NECOM} \leftarrow -80\ \text{CTRAD} + 39\ \text{USAID} + 31\ \text{PORIE}\ (r = .92) \tag{31}$$

This time, on the right hand side of the equation, CTRAD (trade with communist countries) replaced PORIE (port trade orientation) with a reversed sign as the main explanatory factor and USAID (US aid received) appeared as a new supporting factor. The equation tells us that China, in 1963, tended to trade more with the nations which traded less with communist countries and which were under USA influence. The replacement of CTRAD with PORIE in the 1963 equation as a major explanatory variable clearly indicates the change in the nature of China's cold war. In 1955, China followed the Soviet Union's leadership in the cold war between Western powers and the overall communist camp; but in 1963, she already had launched her own cold war against both the old enemy, *i.e.*, the Western powers, and the new enemy, *i.e.*, the Soviet Union and its satellites. The pattern showed clearly the direction of the Chinese

movement toward a world socialist revolution: She avoided the Soviet sphere of influence, and directly aimed at "new" areas under American influence.

To show the effect of the modification of the data on the pattern, the corresponding equations delineated with other data sets (T, R, and RT) were presented along with the original equation in Table 16. To show the fit of the model to the data, the cold war behavioral pattern scores (TRADE - NECOM) were plotted against the political orientation distance scores (CTRAD) in Figure 8.

In this pattern, trade activities were taken as an indicator of the cooperative behavior of China. Then, can we say that trade reflects the policy attitude of the Chinese government toward other nations? The answer is yes.

In many studies in the field of international relations, trade has been used to indicate how salient one nation is to another.[140] This is partly because trade can be regarded as a political instrument with which one nation can control another. Directing trade affords a nation two kinds of advantages. First, trade is an instrument of cultural and political penetration. Second, if one nation can achieve a decisive position as a supplier or customer of another, it can exercise a critical influence on the political and economic policies of the other.[141]

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[140]The number of studies which used trade as an indicator of the degree of transactions between nations is innumerable, especially in the field of integration studies. See, for example, Deutsch, 1957; Savage and Deutsch, 1960; Kitzinger, 1961; Brams, 1966 and Russett, 1967.

[141]For a detailed discussion on the political implication of directed trade, see Padelford and Lincoln, 1962, pp. 413-415.

TABLE 16

CANONICAL STRUCTURE EQUATIONS

FOR CHINA'S COLD WAR BEHAVIOR (TRADE - NECOM)[a]

FACTORS		BEHAVIOR FACTORS							ATTRIBUTE DISTANCES														r^c
		TRADE[b]	FDIPL	INDIP	ECAID	NECOM	CONGO	VISIT	POWER	PORIE	DEVEL	WEST C	URAID	AGRIC	ORIEN	DIVER	WELFA	POSTA	CTRAD	COLON	FCONF	USAID	
1955	O[d]	65[e]	53			35				76			30								37		.95
	T		-53			-68		36	-46	77			37										.92
	R	59	61			-39				79											-32		.97
	RT	-72	57						47	-72													.97
1963	O	-67				-66				-31									80			-39	.92
	T					70	-45	-43	-34		-62	-36	-31										.80
	R	47				-46	54	-43			37	-43					-51		50				.90
	RT					79	-40	37	-47		-48		31				-32		36				.84

[a] For computation, Charles Wall's CANONICAL program was used.

[b] These are factor label codes.

[c] Canonical correlations. All correlations are significant at the .0005 level.

[d] O = Original data (81 dyads), T = Transformed data (81 dyads), R = Reduced data (55 dyads), RT = Reduced and Transformed data (55 dyads).

[e] Only loadings that exceed .30 are given in the table. Signs are as appeared in the original computer outputs. Decimal points are removed.

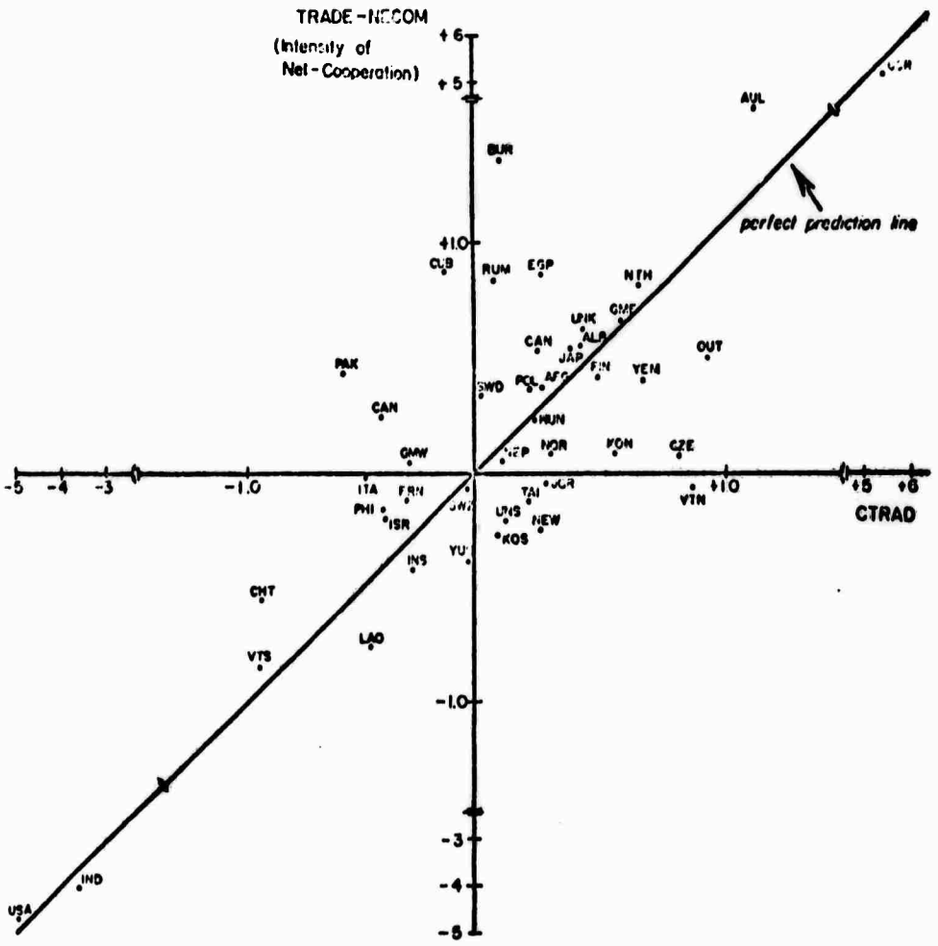

FIGURE 8
CHINA'S COLD WAR BEHAVIOR (TRADE-NECOM)
(canonical variate scores)

Furthermore, the reputation of trade as a valuable indicator was reinforced by the availability and relative accuracy of the data.

In addition, the study of trade has a special meaning for China, because her trade is not merely controlled but directly operated by the government. Thus, trade for China is much more sensitive to politics than for the free nations.

In this pattern, the pattern score is a function of TRADE and NECOM. That is, the score is the remnant value of TRADE after the NECOM value has been subtracted. Therefore, a dyad will have the maximum score when the object nation trades most with China while it receives the least negative communication from China. On the other hand, a dyad will have the minimum pattern score in this cold war pattern when the object in the dyad does not trade with China and receives the greatest negative communication from China.

Thus, we can formulate a scale for the cold war pattern score for a dyad as drawn in Figure 9. As we can see from the figure, the dyad which has a high pattern score does not necessarily have high trade. A big trade partner may have a medium pattern score if she receives nigh negative communication from China.

If we compare this pattern to China's power-interaction pattern discussed in Section 9.1, we can have greater insight into the nature of China's trade, because both patterns comprise TRADE and NECOM. As discussed in Section 9.1, in that power-interaction model, TRADE + NECOM were explained by power distance. But, as discussed above, in the cold war pattern TRADE - NECOM is explained by the difference in political

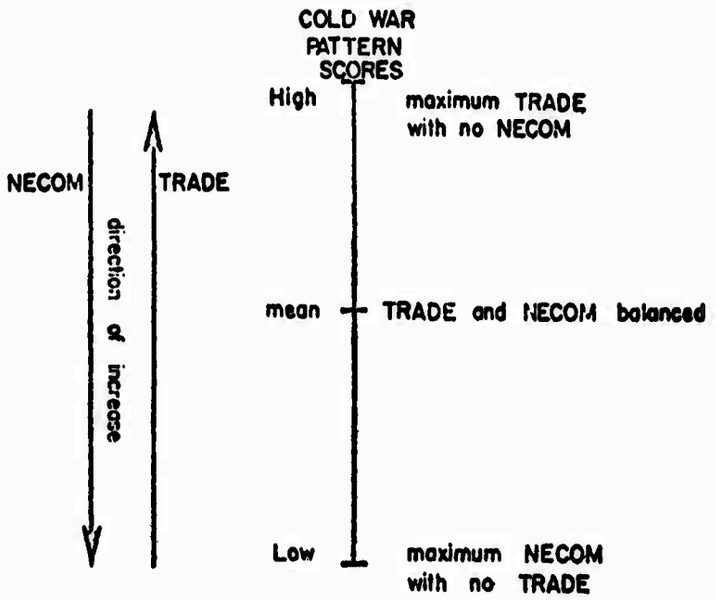

FIGURE 9
SCALE FOR COLD WAR PATTERN SCORES

orientation. This suggests to us that the same trade activity is explained by different attribute distances in different contexts.

Then, in what context is China's trade involved in the interaction pattern as TRADE + NECOM? When is the cold war pattern TRADE - NECOM? My argument is that the decision makers have different decision patterns formulating foreign policy with regard to trade and verbal attack: One is a "power pattern" where "power distance" is the criterion; and the other, may be called a "political orientation pattern." In application of this "double pattern system," it seems that if the object's power is great enough to be considered as a threat to China, she applied the first system; but, if the "power" of the object is not so significant, she applied the second model.

To understand this dual system, it may be helpful to consider two different characteristics of China's trade. For China, as a country, trade is an economic necessity: For example, she has to import machines, tools, etc., to achieve industrialization. On the other hand, as will be discussed in Sections 9.3 and 9.4, China as the leader of the world social revolution, utilizes trade as an instrument for political penetration. A careful examination of the items China traded with each object nation[142] shows these two clearly different kinds of trade. Thus, the first kind of trade, "trade for necessity" takes the form of TRADE + NECOM pattern with POWER as the leading

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[142]See Eckstein, 1966, section 4 of Chapter 4, "Commodity Composition of Communist China's Foreign Trade," pp. 103-17. Especially, Table 4-5 (pp. 106-7) and Table 4-7 (pp. 114-5). See also Sawyer, 1966, Chapter 3, "Commodity Patterns" (pp. 25-40).

explanatory variable, while the second kind of trade, "trade as a political tool" takes the form of TRADE - NECOM pattern with PORIE as the leading explanatory variable.

The relations between the interaction pattern (TRADE + NECOM) and the cold war pattern (TRADE - NECOM) can be clarified if we rely on the status-field theory discussed in Section 9.1. When I discussed the Cooperation (CO) + Conflict (CF) pattern of Rummel's status-field theory in Section 9.1, I also reviewed his new concept of an interaction dimension which is loaded highly by the two independent "clusters" of variables: CO and CF. Now, I will extend this concept to another pattern of CO - CF.

1) Let us suppose that TRADE (CO) and NECOM (CF) are independent, and the joint interaction dimension (I) passes between the two vector clusters (see Figure 10). Then any dyad ($b_{i \to j}$) in the space within the two orthogonal vectors, TRADE and NECOM, has a value on I dimension (i) which is the sum of the value on TRADE vector (t) and that on NECOM vector (n); $i = t + n$.

2) If we extend the NECOM vector in the direction opposite the origin (O), this negative NECOM vector ($\overline{N}$) and TRADE vector again bound a space. If we draw one new dimensional vector which is orthogonal to I, and name it P, then the P will pass through this space bounded by $\overline{N}$ and T. Any dyad in this space will have a value on this P dimensional vector (p) which is the sum of the value on $\overline{N}$ (-n) and T (t): $p = t - n$,

3) From Figure 10, we can easily say that the dyad in T and N boundary has always a greater i value than p value, and the dyad in $\overline{N}$

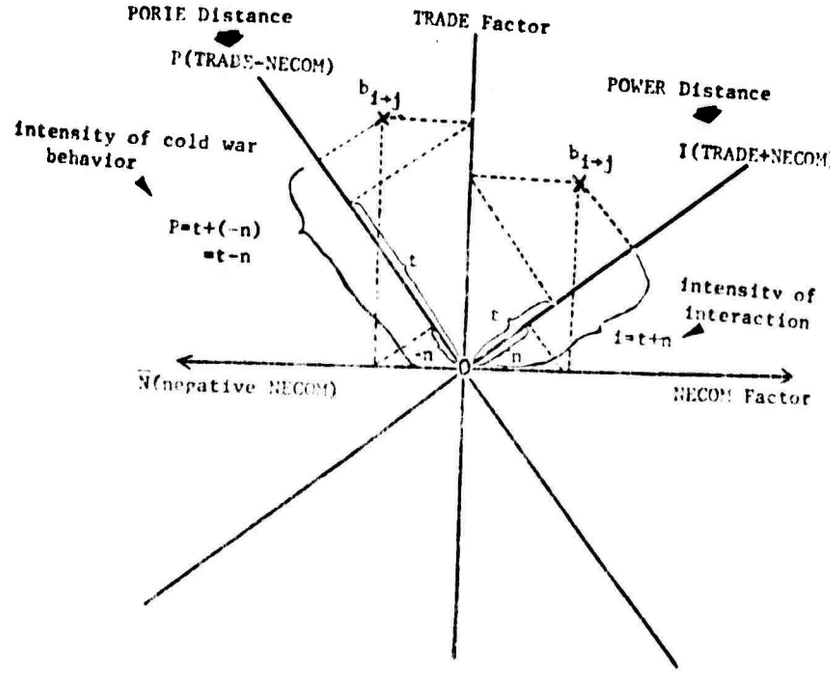

FIGURE 10

COLD WAR PATTERN (TRADE-NECOM)
COMPARED TO INTERACTION PATTERN (NECOM+TRADE)

and T boundary has always a greater p value than i value.

4) Suppose the I behavior dimension is highly correlated with the power distance dimension in A-space and P with the political orientation difference dimension, respectively. Then, for each dyad, i (= t + n) is better explained by power distance, than by political orientation difference, while p (= t - n) is better explained by the political orientation difference than by the power distance.

From this, we have two different behavior patterns: TRADE + NECOM = f(power distance), which is my "power pattern," and TRADE - NECOM = f(political orientation difference), which is my "political orientation pattern."[143]

9.3 Formal Diplomacy of China

Formal diplomacy in this study is defined as "the behavior of establishing diplomatic relations with other nations and maintaining those relations." The formal diplomacy factor emerged distinctly from the factor analyses of B-space in all four parallel data sets for both years, with DIPFP (diplomat sent from Peking) and DIPTP (diplomat to Peking) as the high loading variables.[144]

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[143]If we express the two patterns in one equation, we have the cooperation and conflict theorem of Rummel's status-field theory. Instead of political orientation, let us put economic development (ED). Then, the above two equations will be CO + CF = f(PD), and CO - CF = f(ED), where PD is power distance. If we add the two equations, then, CO = f(PD +ED), and if we subtract the second from the first, CF = f(PD - ED). By giving some adequate parameters, and rearranging them, this will be easily transformed into CO + CF = $(\alpha_1 * - \alpha_1)d_1 - (\alpha_2 * + \alpha_2)d_2$.

[144]The loadings (original data set) were .90 for both DIPFP and DIPTP in 1955 and .96 for both variables in 1963.

The pattern found for China's formal diplomacy, in the form of the structure equation,[145] was

$$51\ \text{FDIPL} + 42\ \text{TRADE} + 50\ \text{ECAID} + 37\ \text{CONGO} + 43\ \text{PORIE} - 34\ \text{WESTC} - 39\ \text{URAID} - 44\ \text{ORIEN} - 44\ \text{DIVER} \quad (r = .73) \tag{32}$$

Although seemingly complicated, since there are so many factors involved in both sides of the equation, a closer examination of the relationships reveals a simple linkage. First, the left side factors are all related to the administrative behavior of maintaining friendship in the world community. FDIPL and CONGO are purely administrative behaviors, while TRADE and ECAID are supporting behaviors to achieve friendship. Second, the right side factors (attribute distance) comprise two groups: cold war group identifiers (PORIE, WESTC, URAID), and the indicators of Asian neighbors (ORIEN, DIVER).

A verbal interpretation of the pattern, then, is that the stronger the object nation's ties to the Communist camp and the stronger her cultural affinity to China, the stronger are the formal diplomatic ties with China.

This time the strength of the pattern linkage was not so strong. The r^2 was .53 and this means that a little more than half of the total variance was accounted for by the relations.

Although the basic forms of the relationship were similar, one noticeable shift of factors was detected between the equations of 1955 and 1963. The TRADE factor disappeared in the 1963 equation. As men-

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[145]For the equations with other data sets, see Table 17.

TABLE 17

CANONICAL STRUCTURE EQUATIONS
FOR CHINA'S FORMAL DIPLOMACY[a]

FACTORS		BEHAVIOR FACTORS							ATTRIBUTE DISTANCES														r^c
		T[b] TRADE	F DIPL	I MIP	E CAID	M ECOM	C ONGO	V ISIT	POWER	POOR IE	DEVEL	WEST C	URAID	AGRIC	ORIEN	DIVSR	WELFA	POSTA	CTRAD	COLON	FCONF	USAID	
1955	O[d]	-42[e]	51		50		37			43		-34	-39		44	44							.73
	T	-30	-69	-48				-40		36	-40		-40	-30					36				.37*
	R	-50	61		-45					30		43	-39			55				30		30	.79
	RT	-41	-39			38		69						-38		-32	-40	-38			-48		.74
1963	O		-76		32		38			-69					42								.85
	T		83		-31					-84													.88
	R	49	-67			39	37			-57		-34							-63				.94
	RT		-93							82		-35											.93

[a] For computation, Charles Wall's CANONICAL program was used.

[b] These are factor label codes.

[c] Canonical correlations. The correlation with * is not significant at the .25 level. All others are significant at the .0005 level.

[d] O = Original data (31 dyads), T = Transformed data (31 dyads), R = Reduced data (55 dyads), RT = Reduced and Transformed data (55 dyads).

[e] Only loadings that exceed .30 are given in the table. Signs are as appeared in the original computer outputs. Decimal points are removed.

tioned elsewhere, this shift appears to be the result of the "*cheng-ching fen-li*" policy of "division of politics and business," strongly advocated by the Chinese policy makers. The equation for 1963 was

$$76\ \text{FDIPL} + 32\ \text{ECAID} + 36\ \text{CONGO} + 69\ \text{PORIS} - 42\ \text{ORIEN} \qquad (r = .85) \tag{33}$$

When China was a young country (1952), she was contained in the sphere of international Communism. Recognized mainly by the other colleagues of the Socialist Camp, she generally traded with the members of the bloc. In the pattern, therefore, FDIPL and TRADE appeared in one equation. In 1963, however, China was mature enough to claim her own identity in the world community. No longer a puppet of international Communism, she began to trade for necessity, ignoring the political orientation of the object nation. The "*cheng-ching fen-li*" policy was convenient for her under these circumstances as it always has been for similar cases in Oriental culture.[146]

Formal diplomacy has a special meaning for China, somewhat different from other European countries. Historically, China's foreign policy centered around formal diplomatic relations. The core of the well-known tributary system of China's past dynasties (especially of Ming and Ch'ing) had been the maintenance of formal supremacy of the Chinese court over other nations, even though this has not necessarily

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[146]For instance, Japan maintains the same policy toward all divided countries: China, Korea, Vietnam and Germany. Inoguchi's view was different (Inoguchi, 1970, p.50). He viewed that China's trade was determined by political consideration. His view was that China's dominant policy on trade was "*cheng-ching bu-ke-fen*" (indivisibility of economics from politics) instead of the "*cheng-ching fen-li*" policy.

provided economic advantages or other benefits to China. The same principal had been retained after 1949.[147]

Considering their emphasis on formal diplomatic relations, we can understand why China has maintained and still maintains stubbornly the "Hallstein Doctrine," which in China's case means "she will not establish diplomatic relations with those who recognize the Republic of China (Taiwan) as a separate entity other than the not-yet-liberated portion of China." In this vein, we must understand that her formal diplomatic behavior toward other nations has much more political implications rather than a mere administrative behavior.

In the formal diplomacy pattern of China, again we can spot the significant impact of the skewed nature of the original data. As we can see in Table 17, the differences among the patterns delineated by each of the four parallel data sets were remarkable, although the major forms of pattern relationship was retained. Presentation of one clearer pattern will have sense in order to see the effect of the extreme values. The same equation for the 1963 space with the RT data was

$$93\ \text{FDIPL} + 82\ \text{PORIE} - 35\ \text{WESTC} \qquad (r = .93) \qquad (34)$$

This is simpler than the equation with the original data presented earlier. This time the data was transformed and the number of cases was reduced by excluding "low-transaction" objects. The rela-

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[147]The core concept of the Ch'ing tributary system and its relationship to Communist China's foreign policy, can be found in Rhee, "The Ch'ing Tributary System and the Foreign Policy of the People's Republic of China," unpublished monograph, 1969.

tion delineated by this equation may be said to be the clearest in the sense that the effect of the extreme values and low variance problem were simultaneously removed. The result tells us that China's formal diplomatic behavior can be explained by the political orientation of the object nation. The r for this equation was .93 which tells us that more than 86 percent of the total variance was accounted for by the model.

For a graphic check of the pattern relationship depicted by this equation, the predicted value of the formal diplomacy dimension for some interesting nations were plotted with the combined score of political orientation (PORIE) and Western culture (WESTC) dimensions in Figure 11 (RT-63 data were used).

In conjunction with formal diplomacy, it is worthwhile to look at China's activity in the realm of international organizations, since participation in international organization has also been regarded widely as an important administrative behavior[148] which keeps channels open for a nation to cooperate with others.

The list of NGOs of which China was a member shows that China was not active in international organizations.[149] For instance, in 1963 out of a total of 1722 NGOs, China had membership only in 57 (in

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[148]International organizations in this study refer to only NGOs. During the years covered by this study, China was a member of only one IGO, the Joint Nuclear Research Institute organized by seven Communist countries in 1956. Therefore, IGO was excluded from the study.

[149]See Appendix I-B, the raw data table.

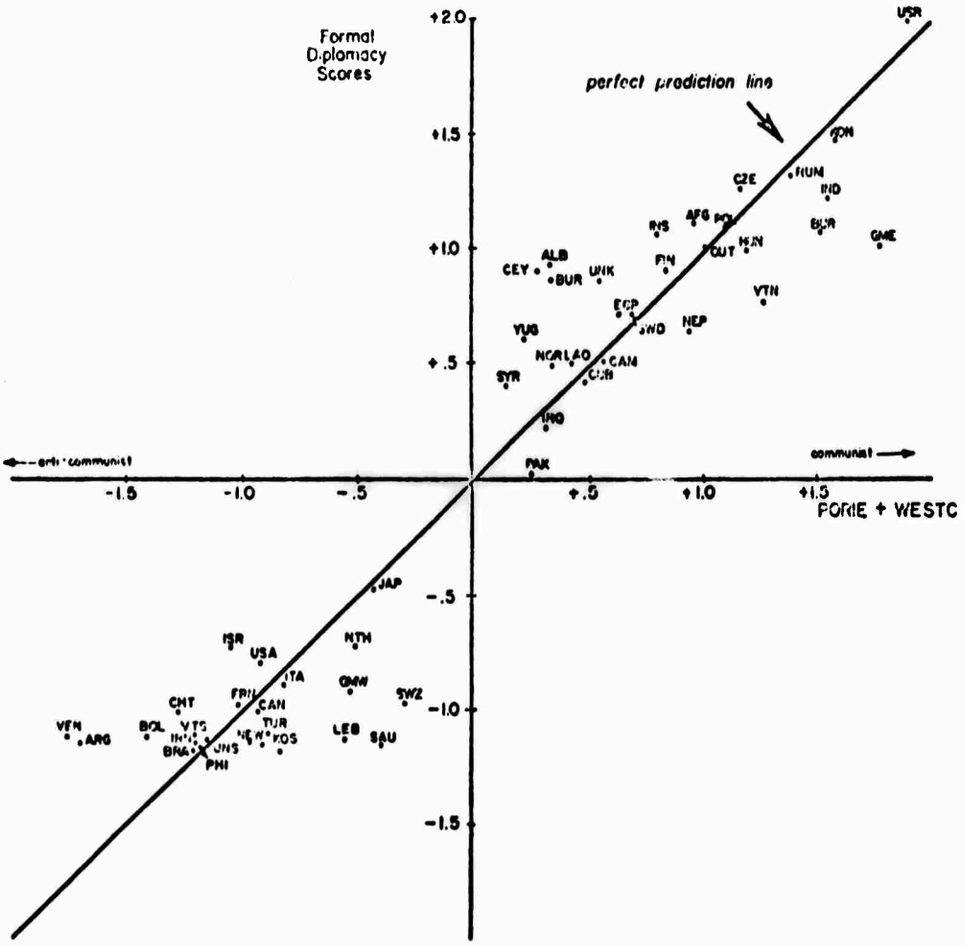

FIGURE 11
CHINA'S FORMAL DIPLOMACY
(canonical variate scores)

1955, 22 out of 1221). Furthermore, these NGOs were mostly sports-related ones. It is difficult to speculate why China did not show interest in international organizations. One possible conjecture is that China was not able to participate because of the objections of the Western bloc nations. Most of the international organizations had been established long before China became independent. The Republic of China (CHT), with support from the Western powers such as USA and UNK, has been an active participant in these organizations, and has consistently blocked China's entry.

The results of the canonical analysis indirectly supported this view (see Table 18). The results of the canonical analysis of the 1955 original data was

$$75\ \text{CONGO} + 46\ \text{VISIT} + 35\ \text{TRADE} + 53\ \text{DEVEL} + 42\ \text{WELFA} - 40\ \text{DIVER} \quad (r = .58) \tag{35}$$

This meant that "the more a nation is developed (DEVEL and WELFA) the more memberships in NGO she shares with China." Considering that the absolute frequency of NGO memberships of a nation is directly proportional to her economic development, it can be expected that China would share more memberships in NGOs with wealthy, developed nations. Therefore, the finding does not mean much for China's foreign behavior.

TABLE 18

CANONICAL STRUCTURE EQUATIONS
FOR CHINA'S IGO-COMEMBERSHIP[a]

FACTORS		BEHAVIOR FACTORS							ATTRIBUTE DISTANCES														r^c
		TRADE[b]	FDIPL	INDIP	ECAID	NECOM	CONGO	VISIT	POWER	POORE	DEVEL	WESTC	URAID	AGRIC	ORIEN	DIVER	WELFA	POSTA	CTRAD	COLON	FCONF	USAID	
1955	O[d]	-35[e]					-75	-46			-53					40	-42						.58**
	T		-31	58	55		-34	-35				35			34	42						68	.26
	R						64	62			33	40	40				-33						.54*
	RT		-32	43	57		54					-57		33	-31	42					-34		.32
1963	O		42				80		-31	43	54						39						.86**
	T	-57					-65	41					-34	44			-48					-40	.47
	R	46	64				54			57	36		-32	-30									.83**
	RT	60		57			-53							60					40			-37	.47

[a]For computation, Charles Wall's CANONICAL program was used.

[b]These are factor label codes.

[c]Canonical correlations. **Significant at the .01 level. *Significant at the .10 level. Others, not significant at .10 level.

[d]O = Original data (81 dyads), T = Transformed data (81 dyads), R = Reduced data (55 dyads), RT = Reduced and Transformed data (55 dyads).

[e]Only loadings that exceed .30 are given in the table. Signs are as appeared in the original computer outputs. Decimal points are removed.

In 1963, the results of the analysis were almost similar to that of 1955. The equation was,

$$80\ \text{CONGO} + 42\ \text{FDIPL} + 54\ \text{DEVEL} + 43\ \text{PORIE} + 39\ \text{WELFA} - 31\ \text{POWER} \quad (r = .86) \tag{36}$$

Again, the same tendency appeared; the more powerful, wealthier, and developed nations had more co-membership with China in NGOs. Only PORIE on the right hand side of the equation needs to be explained; China was better accepted by those NGOs where more socialist countries were participating.

9.4 Informal Diplomacy of China

Another important aspect of China's foreign policy was her informal diplomacy--diplomacy with the non-governing political party of the object nation.

One of the indisputable objectives of China's long-term foreign policy has been to spread communism, eventually, to achieve a world-

wide "social revolution."[150] Furthermore, China has wanted to play a leading role in the process of this "socialist construction,"[151] and has insisted that other nations model their revolution after the Chinese "prototype."[152] This long-range aim of China's foreign policy was based on the Chinese communists' belief in the historical

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[150]This basic theme of China's foreign policy goal was expressed by Mao Tse-tung himself, as early as in 1949, saying that "...we must unite in a common struggle with those nations of the world who treat us on the basis of equality and with the people of all countries. This is to ally ourselves with the Soviet Union, to ally ourselves with all the New Democratic countries, and to ally ourselves with the proletariat and the broad masses of the people in other countries, to form an international united front ... in order to destroy imperialism and its running dogs." (Mao Tse-tung. "On the People's Dictatorship," delivered on July 1st, 1949. The English translation was taken from the *China Digest*, Vol. VI, No. 7). Halpern also clarified the long-term aim of China's foreign policy: "...to free China from foreign control and to make China once again great are the purposes of Chinese communist, as well as of the other Chinese governments. But in the communist's view, China can be freed only by associating herself with a world revolutionary movement aimed at transforming all existing societies. Further, in their view, China's greatness can be restored or assured only by her effective participation in this world movement ... The long-range aim of the Chinese communists, is not merely to get along in the world claiming for their country as much respect as the conditions let them attain. They aim beyond that to transform the world and to dictate the forms of organization of other societies into proletariat world order." (Halpern, 1968, pp. 2-3). See also Barnett, 1962, p. 85, Hinton, 1966, pp. 117-8, and Boyd, 1962, p. 84.

[151]Hinton, *Ibid.*, pp. 69, 117. Mao Tse-tung wrote "the Chinese revolution would exert a far-reaching influence on the revolution in the East as well as in the whole world" (*Selected Works*, Vol. I, p. 191). See also Boyd, *ibid.*, p. 84.

[152]Hinton, *ibid.*, p. 117: "The CPC (Communist Party of China) certainly aspires to provide a 'model,' or example, and if possible a degree of leadership, for the whole of the underdeveloped areas (the 'oppressed nations')."

inevitability of the coming of a new world.[153] Mao Tse-tung stated that "...in the end, the socialist system will replace the capitalist system. This is an objective law independent of human will. No matter how hard the reactionaries try to prevent the advance of the wheel of history, revolution will take place sooner or later and will surely triumph."[154] This kind of belief, of course, is a vision, not a policy or strategy. But, a vision, seriously believed, can affect policy choice, and the effect of this vision can be reflected in their strategy.

To promote the expansion of communism in "semi-colonial" areas, the Chinese have employed first a strategy of protracted struggle, "which is based on a belief in the ultimate success of persistent, cautious and flexible aggression against the imperialist countries."[155] As one of the instruments to carry out this struggle, she has made great use of "people's diplomacy," which is a non-formal, people-to-people (actually the Chinese government and the communist parties in non-communist countries) diplomacy as well as direct opposition to the West.[156] Since her independence, China has maintained a liaison with

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[153]"Chinese Communists accept as articles of faith the basic Marxist concepts of dialectical and historical materialism, world-wide class struggle, and the inevitable overthrow of 'decaying capitalism' by the 'proletariat' of all countries" (Barnett, 1960, p. 68).

[154]Speech delivered on November 6th, 1957, in Moscow to the Supreme Soviet of the U.S.S.R., *Current Background*, No. 480, November 13, 1957.

[155]Boyd, *op. cit.*, p. 90.

[156]See Boyd, *ibid.*, p. 91, and Hinton, *op. cit.*, p. 119.

most foreign communist parties, "by both covert and overt means."[157]

The basic dimension, "informal diplomacy," had as its highest loading variable PNOVT[158] which was measured by the frequency of unofficial political visits from/to the object nations. Here "unofficial" means that the interaction was with non-ruling political parties in the object nations. Other variables loading highly on this factor were ECOVT (.66 in 1955, .74 in 1963) and ECOVF (.83 in 1955, .94 in 1963). As I argued elsewhere, China maintains a "*cheng-ching fen-li*" policy. One way of implementing such a policy is to trade only with the non-governmental members of the Western countries. As a result, most visitors came for economic reasons acting in a private capacity, providing a nice cover for informal diplomacy. Thus, in many cases, the leaders of non-ruling communist parties in the West were able to visit China for "business purposes."[159] If this is true, then, it explains why PNOVT clustered with ECOVT and ECOVF in the same factor group.

Comparing the two time points, 1955 and 1963, there was a noticeable shift of variables from the TRADE factor to the INDIP factor. That is, CULVT (.66), CULVF (.88) and CONCN (.66) which originally loaded

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[157]Hinton, *ibid.*, p. 120. For detailed interaction of the Chinese Communist Party with other communist parties, see Barnett, 1960, Appendix, "Peking and the Communist Parties of Asia" (pp. 476-501).

[158]The loading was .86 in 1955 and .88 in 1963. For other data sets, see Appendix II-B.

[159]Scrutinizing the news articles in *Jen-min Jih-pao*, for instance, I found that, for most Japanese communist party leaders who visited China, the announced purposes of their tour were business negotiations for a certain trading company or industrial sightseeing.

highly on the TRADE dimension in 1955, loaded highly on the INDIP factor in 1963.

As discussed in 9.1, the shift can be explained in the following way: In 1955 when China was young, decision makers were not prepared to play the sophisticated diplomatic game, and as a result, cultural visits and newspaper coverage[160] were naturally oriented, without any manipulative considerations, toward friendly nations (e.g. the Old-Guards in the socialist camp). In 1963, however, being already mature enough to launch skillful diplomatic campaigns, China's policy makers instrumentalized cultural visits and newspaper coverage as a tool for supporting informal diplomacy. With these slightly differing inner structures of the INDIP factors in 1955 and 1963 in mind, let us examine the structure equations that include INDIP in the set of behavioral combinations (for the equations with other data sets, see Table 19).

The equation for 1955 original data was

$$89\ \text{INDIP} + 32\ \text{FDIPL} \leftarrow -50\ \text{AGRIC} - 37\ \text{ORIEN} - 37\ \text{URAID} + 36\ \text{CTRAD} + 35\ \text{PORIE} \quad (r = .44) \tag{37}$$

First, in B-space, China's INDIP behavior was partly linked to her FDIPL behavior, which was also explicable in terms of her lack of diplomatic skill as I mentioned above. Secondly, in A-space, the highest weighting was on AGRIC (.50), the agricultural characteristics of the object

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[160]Note that the *Jen-min Jih-pao* (The People's Daily), which was used as data source in this study, is published by the Committee of Party Paper (Tang Pao) which is supervised by the Central Political Bureau of the Chinese Communist Party. For details, see Ch'eng, 1969, p. 389.

TABLE 19

CANONICAL STRUCTURE EQUATIONS
FOR CHINA'S INFORMAL DIPLOMACY[a]

FACTORS		BEHAVIOR FACTORS							ATTRIBUTE DISTANCES														r[c]
		TRADE[b]	FDIPL	IMDIP	ECAID	MECOM	COMGO	VISIT	POWER	PORIE	DEVEL	WESTC	URAID	AGRIC	ORIEN	DIVER	WELFA	POSTA	CTRAD	COLOM	FCONF	USAID	
1955	O[d]		32[e]	89						35			-37	-50	-37				36				.44*
	T	-45		64	-34		36				-40			34		-45		56					.55*
	R			-71			46	-37						-60			-37			37	30		.46
	RT	-30		83			-44				38					-42	41	-36	-37				.49
1963	O			71	-68							39		64						-31			.40
	T			-63	-70		-30					-42		-32			30	-44			-41		.38
	R			51	73			-36		-31		51		-52							-35		.47
	RT			46	48		44	58				55					-49				-40		.44

[a] For computation, Charles Wall's CANONICAL program was used.

[b] These are factor label codes.

[c] Canonical correlations. The correlations with * are significant at the .10 level. Others are not significant.

[d] O = Original data (81 dyads), T = Transformed data (81 dyads), R = Reduced data (55 dyads), RT = Reduced and Transformed data (55 dyads).

[e] Only loadings that exceed .30 are given in the table. Signs are as appeared in the original computer outputs. Decimal points are removed.

nation, followed by ORIEN (.37). These two factors together imply that the targets of China's informal diplomacy were her "underdeveloped agricultural Asian neighbors" rather than other industrial Western countries. This finding is interesting, because this exactly supports the proclaimed "periphery first" strategy of Mao Tse-tung's world communist revolution, which distinguishes Mao from Marx-Engels.[161]

In A-space, there were three more factors which were all indicators of the object nation's relation with the socialist camp (URAID, CTRAD and PORIE), that is, the less the influence from the Old-Guard socialist (USR) on the object nations, the more the informal diplomatic connection China has with them. These factors, then, just reinforced the effect of AGRIC and ORIEN.

The pattern was not salient in terms of the canonical correlation. The correlation was .44, which means that the pattern accounted for less than twenty percent of the total variance.[162] Furthermore, the pattern disappeared in 1963. As we can see in Table 19, there is a corresponding pattern equation. The correlation, however, was too low (.40) and statistically non-significant.[163] This implies that the informal diplomacy pattern discussed in this section is unreliable for

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[161]Mao praised Lenin's idea of the "East Round-About Strategy" which said "...the road to Paris is via Peking; liberation of the West is after that of the East; and the road to world revolution is through the East not through the West" (Kim, 1964, p. 33).

[162]The correlation was significant at .10.

[163]The Z value was -0.5. With 18 degrees of freedom, significant Z value at .10 is 1.310. See Table 13-2, o-6.

practical use, although the finding provides us a suggestive model for China's informal diplomacy.

9.5 Penetration Policy of China

Since the end of World War II in the international political scene, economic aid and political visits by high ranking political leaders have been the most common way in which the major powers wooed the developing nations. Economic aid ties a recipient nation to her donor, and political visits by a leader of the powers assure the recipient of their security.

China, as a power, was not an exception. As a pre-landing salvo for her next diplomatic manoeuvre, China usually first utilized informal diplomacy, followed by the establishment of formal diplomatic relations. Then, to tie the object into her orbit, she gave economic aid and exchanged visits by high ranking officials including the head of the government.

Considering Chinese backwardness in economic growth, the decision to give aid must have been much more difficult for her to make than for other powers. Thus, we can say that China's decision was the result of a careful calculation of her long-range policy and, therefore, should be regarded as a very important signal of her future intentions. Thus the ECAID scores can be considered to be a useful indicator of China's strong determination for political penetration.

The delineated pattern for China's penetration policy behavior from 1955 data (for the equations with other data sets, see Table 20) was

$$63\ \text{ECAID} + 57\ \text{VISIT} + 31\ \text{CONGO} + 30\ \text{FDIPL} + 56\ \text{FCONF} + 52\ \text{URAID} - 43\ \text{ORIEN} - 36\ \text{AGRIC} + 33\ \text{CTRAD} \quad (r = .87) \tag{38}$$

which may be interpreted verbally as the following: China's penetration policy targets were chosen to include Asian agricultural neighbors (ORIEN, AGRIC) where the influence by the Soviet Union was relatively low (URAID, CTRAD), who had unstable relations with other nations (FCONF).

The appearance of FDIPL and CONGO on the left hand side of the equation indicated that in 1955, China was still in the stage of soliciting other nations for diplomatic recognition and political tools such as CONGO and VISIT were utilized for that purpose. In this sense, it was no wonder that in 1963 on the B-space side of the equation VISIT and CONGO were replaced by INDIP, which implied that economic aid now became a manipulative instrument, together with INDIP for the protracted struggle.

The equation for 1963 was

$$65\ \text{ECAID} + 64\ \text{INDIP} + 36\ \text{FDIPL} + 63\ \text{URAID} - 39\ \text{FCONF} - 37\ \text{WELFA} + 37\ \text{DIVER} - 34\ \text{WESTC} \quad (r = .45) \tag{39}$$

But this equation was again statistically non-significant ($Z = .01$). Then, why such a salient pattern in 1955 ($r = .87$) turned into such a weak ($r = .45$) and non-significant pattern? One possible

TABLE 20

CANONICAL STRUCTURE EQUATIONS
FOR CHINA'S PENETRATION POLICY (ERAID)[a]

FACTORS		BEHAVIOR FACTORS							ATTRIBUTE DISTANCES														r[c]
		TRADE[b]	FDIPL	INDIP	ECAID	NECON	CONGO	VISIT	POWER	POLIR	DEVEL	WEST	GRAID	AGRIC	ORIEN	DIVER	WELFA	POSTA	CSAID	COMM	FCOOP	USAID	
1955	O[d]		30[e]		-63		-31	-57					52	36	-43				33		-56		.87**
	T				74		56	30			-34		49		-49						-46		.86**
	R		33		65			39					50	38	-42						59		.89**
	RT				75		-62				33	31	-54			34					-36	-43	.89**
1963	O		36	64	65							34	-63			-37	-37				-39	-31	.45
	T		45	-60	57								-43				25		36			-36	.55*
	R			54	-65			-47			-39				-43	31	-57						.51
	RT	-35		55	-65						32			-30	-36	34	-39					31	.61

[a]For computation, Charles Wall's CANONICAL program was used.

[b]These are factor label codes.

[c]Canonical correlations. **Significant at the .005 level. *Significant at the .05 level. Others not significant at .25 level.

[d]O = Original data (81 dyads), T = Transformed data (81 dyads), R = Reduced data (55 dyads), RT = Reduced and Transformed data (55 dyads).

[e]Only loadings that exceed .30 are given in the table. Signs are as appeared in the original computer outputs. Decimal points are removed.

speculation in that it is because, in 1963, China's targets included many new African nations[164] and in this study most of these newly independent nations were omitted from the analysis. The disappearance of ORIEN, AGRIC and CTRAD as high loading factors from the right hand side of equation 39 partly supports this view that China dropped the criterion of "Asian neighbor" in choosing her policy target and broadened her strategic sphere into other underdeveloped areas in Africa and Latin America.

Although the penetration pattern of China discussed above is not prominent as a model, it supports the view of most of the China watchers on Mao's "social construction" scheme: from rural areas (Asia, Africa and Latin America) to the urban area (Western Europe and North America).[165]

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[164]In 1955-6, the recipient nations of Chinese economic aid were North Korea, North Vietnam, Outer Mongolia, Nepal, Cambodia, Indonesia, Albania, Hungary and United Arab Republic. The recipients in 1963-4 included North Korea, North Vietnam, Outer Mongolia, Burma, Nepal, Ceylon, Syria, Yemen, Hungary, Cuba, Guinea, Algeria, Ghana, Tanganyika, Mali, Congo, Kenya, and Somali (underlined are non-Asian nations). In 1955-6, thirty percent were non-Asian, while in 1963-4, sixty percent were non-Asian. Source: 匪情年報 (Fei-Ch'ing Nien pao), 1967.

[165]See footnote 161.

9.6 Summary

In the above five sections, we discussed four distinct and two suggestive behavioral patterns of China. The findings can be summarized as follows:

The four distinct behavioral patterns of China discovered in this study are:

1) The over-all intensity of Chinese interaction with a nation measured by summing her cooperation and conflict behavior with that nation is mainly determined by the power distance of the nation from China. The more powerful a nation, the more likely that she has intense interaction with China.

2) The amount of the net cooperation of China with a nation (remnant cooperation after subtraction of conflict) is mainly determined by the difference of the nation in political orientation from China. The more similar a nation's political orientation to China (more communist party members and more trade with communist nations), the more likely that she has high net cooperation with China.

3) The formal diplomacy of China, measured in terms of the duration of diplomatic relations established, is largely determined by the object nation's political orientation and cultural affinity to China. China's formal diplomacy was directed mainly to the members of the socialist camp.

4) The degree of Chinese cooperation with a nation in international organization is mainly determined by the nation's economic development, and partly by the nation's political orientation. The

more developed a nation, the more likely that she shares membership with China in many international organizations.

The two suggestive patterns found in the study are as follows:

1) The informal diplomacy of China, measured in terms of the strength of China's interaction with non-ruling parties in the object nation, is found to be clearly oriented to world rural areas--non-communist, agricultural Afro-Asian nations.

2) The target of Chinese political penetration, measured in terms of the amount of economic aid and official visits, was revealed to be her unstable, developing Asian neighbors who were under American influence and where the Soviets had little interest.

Relations of the findings to current theories in international relations are:

1) The result strongly supports Rummel's status-field theory theorem that the joint behavior of cooperation and conflict are well explained by power distance and difference in economic development together.

2) The result partly supports the original status theory notion that conflict is more likely when there is a great power disparity between two nations. Partly, because this is true only if the disparity is positive (the object nation is more powerful).

3) The result supports the power transition theory (Organski) that when a new emerging power (China) challenges the old existing power, conflict is more likely.

CHAPTER X

RESULTS OF APPLICABILITY TESTS

As discussed in 4.5, to test the applicability for a practitioner of the empirically derived prediction models for China's foreign behavior, the 1963 behavior scores were forecast with the MRM and the CRM, respectively. The forecast scores, then, were compared with the actual observed scores.

The underlying logic is that, if field theory is valid, and, therefore, China's perceptual (P) and behavioral (Q) frameworks are the same across time, the structural equations that explain China's foreign behavior systems, which is generated from the data at one time point, should be applicable at any other time point. In short, the models, once generated, should be applicable under any circumstances.[166]

The tests were performed with 1955 and 1963 data using the 1955 model to predict the 1963 behavior scores: First, from the analysis of the 1955 data, the P and Q (in the MRM, P only) in equation (18) (10 for the MRM) were calculated. Then, applying P and Q of the 1955 models to the 1963 attribute distances, the 1963 behavior scores were forecast ($\hat{W}$). The forecast score of each behavioral factor were correlated with the corresponding observed score.

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[166]This implies that a nation's foreign behavior decision making system is invariable across time. Attribute distances and actual behavior may change. But the pattern relationship between them should be unchanged.

As discussed in Chapter IV, the test was carried out three times: 1) forecasting the factor scores of behavioral basis dimensions with MRM, 2) the same forecasting with CRM, and 3) forecasting the behavioral pattern scores (canonical variate scores) with CRM. The results are given in Table 21, 22, and 23, respectively.

10.1 Forecasting Behavioral Scores with MRM.

Out of the seven forecast behavioral scores of 1963 with MRM, three were fairly good. The correlations between the forecast and observed scores for FDIPL (foreign diplomacy), NECOM (negative communication) and CONGO (co-membership in international non-governmental organization) were .70, .69, and .70, respectively. This means that for these three, we could forecast about half of the variances of the 1963 behavior with the MRM model. The next good forecast was for TRADE (trade). The correlation was .55 which meant that thirty percent of the variance in the 1963 trade behavior could be forecast by the model. For the remaining three behaviors, however, the correlations were low: .32 for INDIP (informal diplomacy), .26 for ECAID (economic aid) and .05 for VISIT (official political visit). The mean of the squared sum of the seven correlations was .28 (trace r = .53), which meant that approximately one-third of the total variance of the seven behaviors could be predicted with the model.

The forecast results were encouraging in that with few exceptions, the off-diagonal correlations in the table were very low. That most off-diagonal correlations were near zero strongly indicates that the decision framework of Chinese policy makers was fairly invariant

TABLE 21

TEST RESULTS OF FORECASTING 1963 BEHAVIOR FACTOR SCORES WITH MULTIPLE REGRESSION MODEL[a]

			OBSERVED						
			1	2	3	4	5	6	7
			TRADE	FDIPL	INDIP	ECAID	NECOM	CONGO	VISIT
FORECAST	1	TRADE	.55				-.37		
	2	FDIPL		.70					
	3	INDIP			.32				
	4	ECAID				.26			.31
	5	NECOM					.69		
	6	CONGO						.70	.30
	7	VISIT							.05
Mean of the squared main diagonal elements = .28 (trace r = .53)									

[a]Figures in the table are product-moment correlations. Only the correlations that exceed .30 are given (on main diagonal, all are given).

TABLE 39

TEST RESULTS OF FORECASTING 1963 BEHAVIOR FACTOR SCORES WITH CANONICAL REGRESSION MODEL[a]

			OBSERVED						
			1	2	3	4	5	6	7
			TRADE	FDIPL	INDIP	ECAID	NECOM	CONGO	VISIT
FORECAST	1	TRADE	.44				-.36		
	2	FDIPL		.69					
	3	INDIP			.32				
	4	ECAID				.08	.35		
	5	NECOM					.65		
	6	CONGO						.65	
	7	VISIT							.03

Mean of the squared main diagonal elements = .23 (trace r = .49)

[a]Figures in the table are product-moment correlations. Only the correlations that exceed .30 are given (on main diagonal, all are given).

TABLE 23

TEST RESULTS OF FORECASTING 1963 BEHAVIOR PATTERN SCORES WITH CANONICAL REGRESSION MODEL[a]

ACTUAL[c] BEHAVIOR PATTERN		r[d]	FORECAST[b] BEHAVIORAL PATTERN						
			I	II	III	IV	V	VI	VII
I	INTERACTION	.97*	.85						
II	COLDWAR	.92*		.33				.34	
III	INT'L ORG	.86*		.32	.52			.44	
IV	FORMAL DIPL	.85*		.38		.51			
V	PENET (ECAID)	.44					.33		
VI	INFORMAL DIPL	.40						.07	
VII	PENET (VISIT)	.20							.12
Mean of the squared main diagonal elements = .21 (trace r = .46).									

[a]Figures in the table are product-moment correlations. Only $r \geq .30$ are given (on main diagonal, all are given).

[b]Forecast canonical variate scores $\hat{W}$.

$\hat{W}$ is calculated from the following equation.

$$\hat{W} = D_{63}P_{55}$$

where D_{63} is the attribute distance matrix of 1963.

P_{55} is the canonical regression weights of D distance matrix from 1955 data analysis.

[c]Canonical variate of 1963 behavioral factors.

[d]Corresponding canonical correlation in 1963 study. Asterisk (*) shows that the r is significant at .05 level.

across time (from 1955 and 1963), because it tells us that similar weightings (P) were applied to the attribute distances (D) in both 1955 and 1963 to decide each behavior (W).

10.2 Forecasting Behavioral Scores with CRM.

As discussed in Chapter IV (4.5), the forecast results with CRM must be the same as those with MRM. Tables 21 and 22 confirm our expectation. Both tables look quite similar with the same high correlations (about .70) for FDIPL, NECOM, and CONGO, and the same medium correlation for TRADE in both tables.

But, in a one by one comparison of the correlations in the two tables, we can find that the correlations with CRM are slightly lower than those with MRM. This is because there were more computational errors in the CRM results.[167]

The forecast scores of the three good predicted behaviors are plotted against each corresponding observed score in Figures 12, 13, and 14, respectively.[168]

10.3 Forecasting Behavioral Pattern Scores with CRM.

The behavioral pattern scores are the weighted sum of the behavioral scores in the pattern [see Chapter IV, 4.5 (2)]. For example, the interaction pattern discussed in 9.1 was (.88 TRADE +

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[167]The $\hat{W}_{63}$ for MRM was calculated with the equation $\hat{W}_{63} = D_{63}P_{55}$, which is simpler than the one for CRM, $\hat{W}_{63} = D_{63}P_{55}Q_{55}^{-1}$.

[168]Since the results of the MRM and the CRM were very similar, only those of the CRM were plotted.

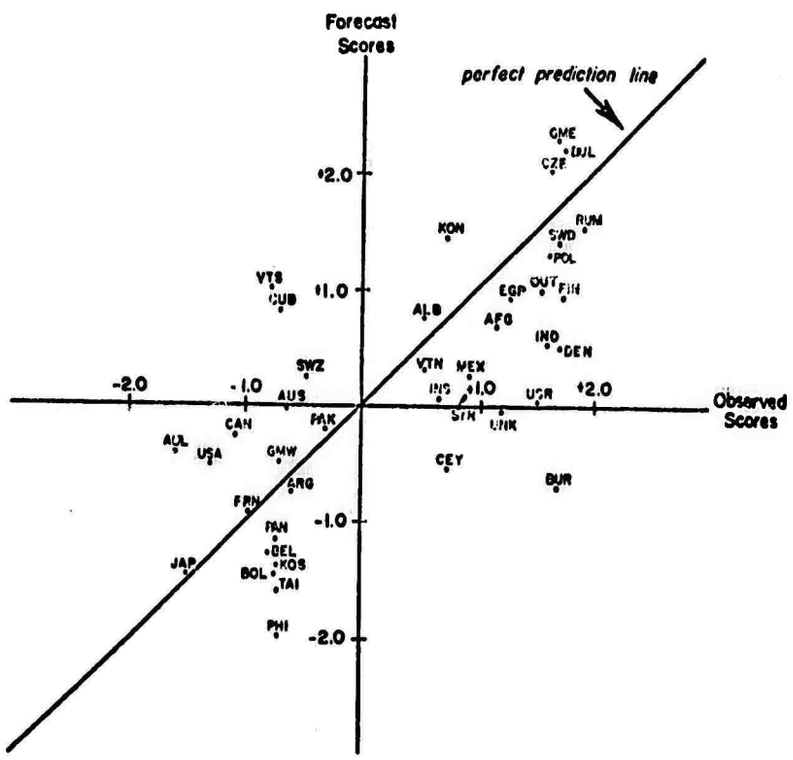

FIGURE 12
CHINA'S FORMAL DIPLOMACY SCORES:
FORECAST VS. OBSERVED

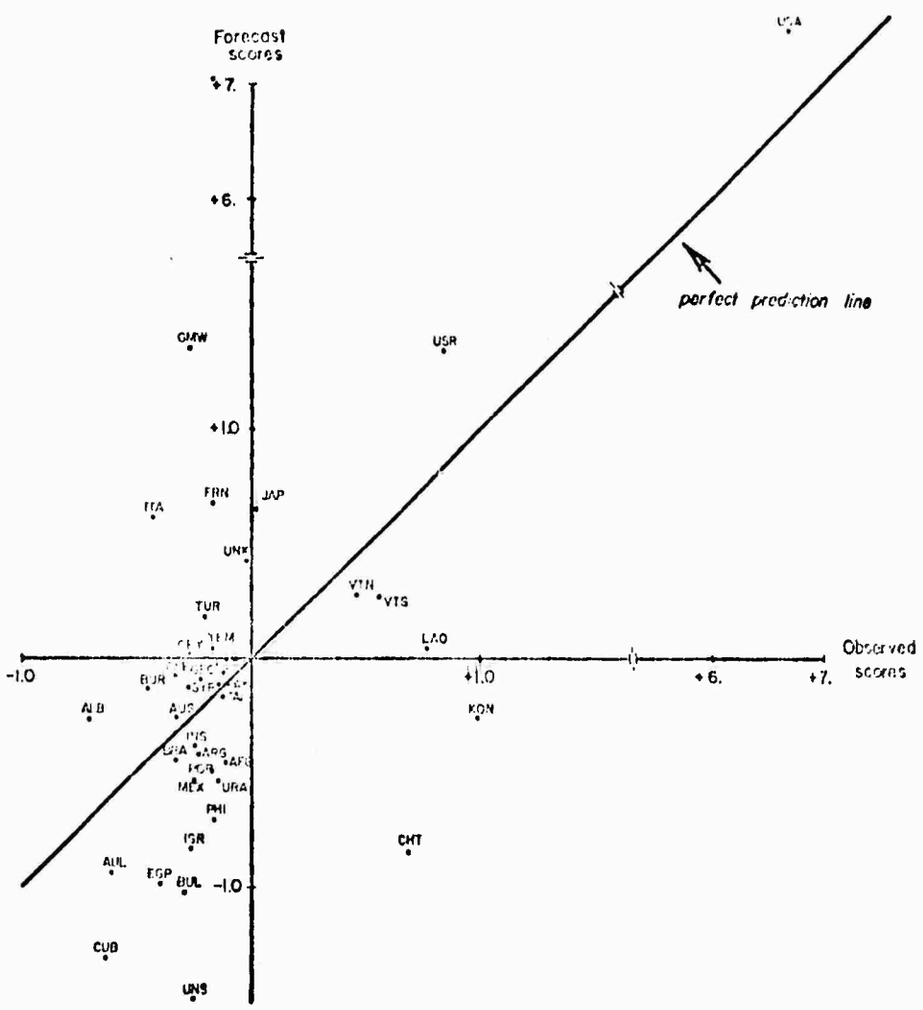

FIGURE 13
CHINA'S NEGATIVE COMMUNICATION SCORES:
FORECAST VS. OBSERVED

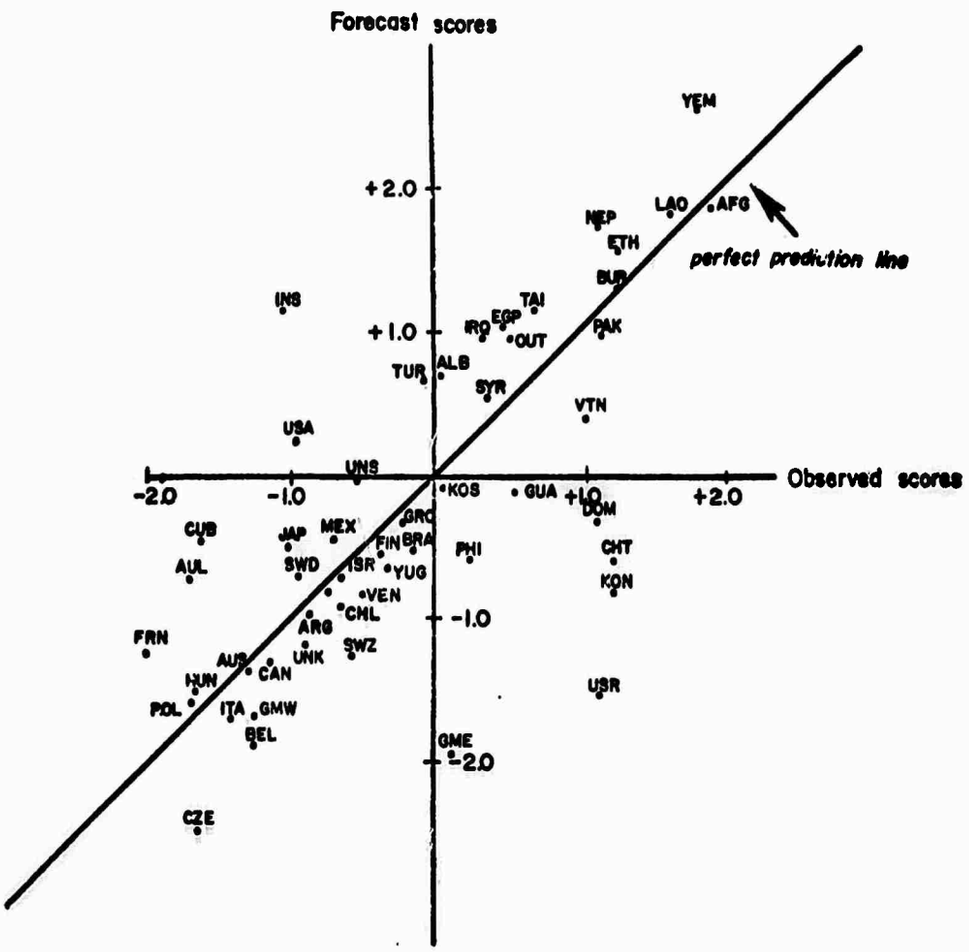

FIGURE 14

CHINA'S NGO CO-MEMBERSHIP SCORES: FORECAST VS. OBSERVED

.46 NECOM) which was explained by POWER. The pattern score of a dyad for this behavioral pattern is, then,

.88 x (factor score of the dyad on the TRADE dimension, +

.46 x (factor scores on the NECOM dimension).

In other words, the pattern score is the score of the canonical variate calculated from the canonical regression analysis.

As mentioned before (Chapter IV), the behavioral pattern scores for all dyads in 1963 were forecast from the 1963 distances with the 1955 weightings (P = perceptual framework). Then, these forecast pattern scores ($\hat{W}_{63}$) were correlated with the observed pattern scores (W_{63}). The results were presented in Table 23.

Out of seven forecast pattern scores, the one for the first pattern--power-interaction pattern (TRADE + NECOM)--was strikingly good. The correlation for the pattern was .85 which means that more than seventy-two percent of the pattern variance was correctly forecast by the model. The result strongly supports that, at least, for China's interaction behavior, her foreign policy makers have invariant decision patterns: whenever they perceived the distances, they gave similar weightings to the attribute distances over time, and they applied a similar behavioral preference pattern in both years. The findings assure us that if we can tolerate about thirty percent error on the average we may apply this model to forecast future Chinese interactions from the power parity between China and the object nations.

The next good forecasts were for the international organization behavior pattern (r = .52) and the formal diplomacy pattern (r = .51). The accuracy of the forecasting for these two behavioral patterns was, in terms of the variance, about twenty-five percent. Although the accuracy is good enough to support the stable decision patterns, I think, the pattern is not stable enough to forecast actual intensity of the behaviors for practical use.

The forecast for the cold war behavioral pattern of China was not so good (r = .33). As we discussed in 9.2, the pattern was salient (canonical r = .92, significant at .05) in both 1955 and 1963. Thus, we could expect higher correlations in forecasting. This unexpected result may be attributable to Chinese shift from the traditional cold war led by the Soviet Union against Western Powers to a new cold war of her own, challenging both the Western Powers and the Soviet Union.

The results of forecasting for the remaining three behavioral patterns were not so good (r was .33, .07, and .12). This was because all three patterns were statistically not significant (see Chapter IX, introductory).

Figure 15 plots the forecast pattern scores of Chinese interaction with all object nations is 1963 against the actual scores.

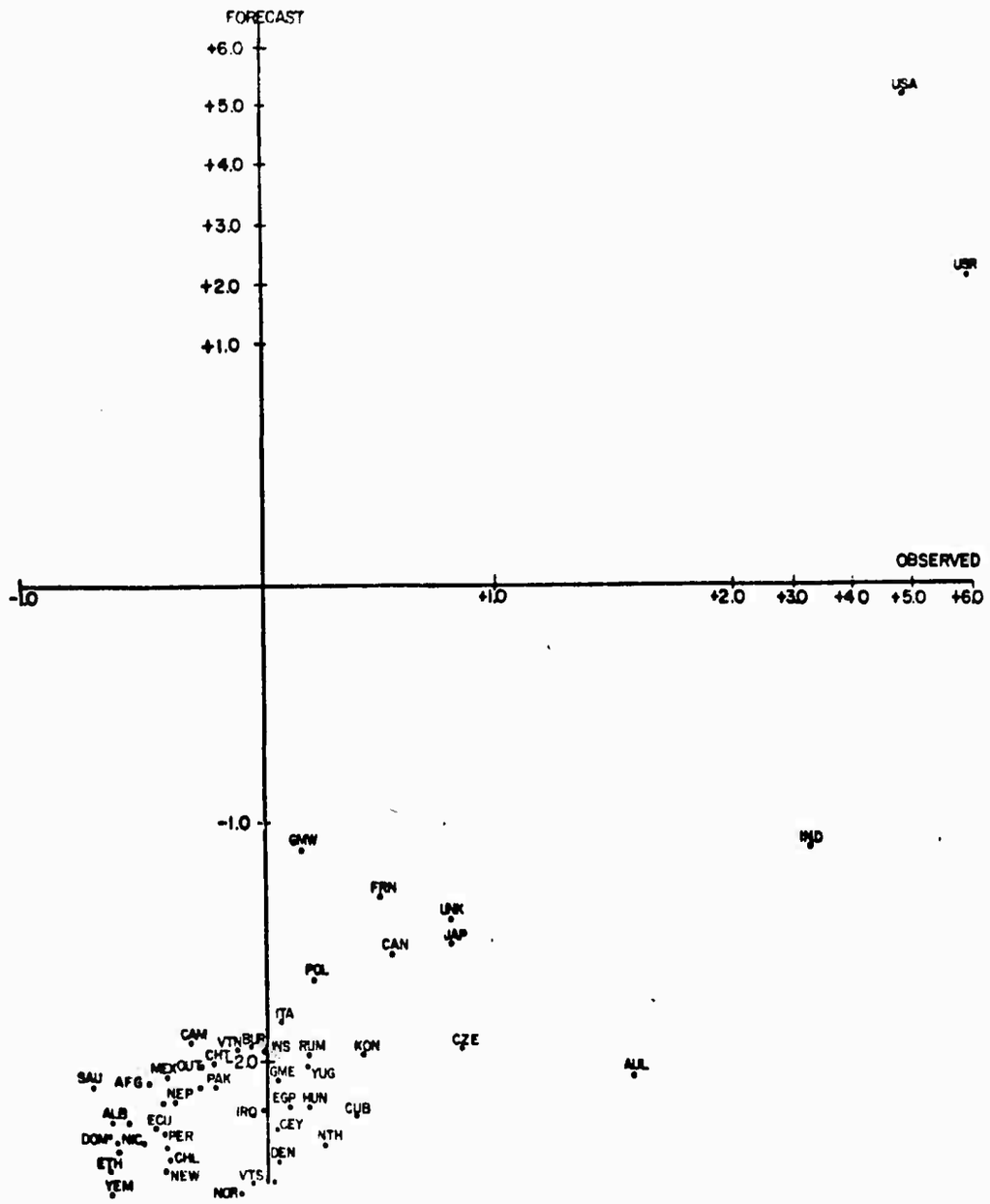

FIGURE 15
CHINA'S INTERACTION PATTERN
FORECAST VS. OBSERVED
(pattern scores)

CHAPTER XI

CONCLUSION

The study as a whole was quite successful. The only results that did not meet my expectations were the forecasts with the developed models. For several behaviors the forecasts were fairly good, but for some others, unsatisfactory. Nevertheless, the results as a whole were very encouraging.

First, despite the limitations on selecting variables and with possible errors in the data, Rummel's field theory Model II was found to be applicable to a one-actor dyadic behavior study. The proposed linear linkage between attribute distances and dyadic behaviors was found to exist, and a direct application of the model to empirical data was proven to be useful for delineating pattern relationships among behavior factors and attribute distance factors.

Second, as a whole, more than half of the total variance in China's behavior could be explained by the delineated linear patterns. Out of the seven patterns on China's behavior and attribute distance linkages, attempted to be formulated through the analysis, four empirically applicable patterns could be successfully delineated. These were: the Chinese interaction pattern, comprising of conflict and cooperation behavior and explained by power distances; the Chinese cold war pattern, measuring Chinese net cooperation with a nation, explained by her political orientation; the Chinese formal diplomacy pattern

which is linked to the object nation's political orientation and her cultural and geographical affinity to China; and Chinese cooperation with a nation in international organization, which is explained by her economic development. All of these four patterns were statistically significant and the predicting powers of these pattern models ranged from ninety-nine percent to fifty percent of the variance in behavior variables, which means that with these models, China's behavior can be practically explained and predicted.

Third, the stability of patterns across time was within the satisfactory range, considering the problems involved in data handling. This means that the pattern models can be utilized to understand the future behavioral pattern of China.

Although most of the empirical findings of China's behavior from the application of field theory only reconfirm our general knowledge about her behavior and no new significant pattern was delineated at this point, the findings as a whole have significant implications for the study of a nation's foreign behavior in general as well as China's foreign behavior particularly.

First of all, the study results clearly show us that we can approach the study of foreign behavior of a nation with a general theory. Traditionally, it has been believed by many that a nation's foreign behavior is idiosyncratic to that nation, and, therefore, it is dangerous or impossible to study a nation's particular foreign behavior with a general theory, because there are so many factors that compose a special context within which a foreign policy is formulated.

But this study showed that China as a nation also follows a certain general rule: her foreign behavior is a linear function of her similarity to and differences from the object nations on various attributes. This means that there is a law that underlies every nation's foreign behavior. As we have seen, the apparently unique behavior of China can be explained by a general law.

Secondly, the results showed us that a nation's unique foreign behavior decision making system can be studied from the "outputs" of the decisions. In the past, it was believed that we needed to examine the contextual background of the decision situation in order to define the unique decision making system of a nation. The personal history of key decision makers, the general belief system of the society, the historical legacy of the decision making apparatus, societal environmental factors that may affect the decision makers' perceptual bias, etc., were studied to uncover the foreign behavior decision making system.

In this study, however, all these factors were theorized to be contained in the decision makers' perceptual and behavioral framework. Then, by studying the resulting behavior, and without a detailed study of each factor, the unique perceptual and behavioral framework of the decision makers were defined, and it was found that the discovered framework by this way was reliable. Considering the difficulty of studying each individual factor which may affect the decision makers' perception and behavior, this way of defining the decision making system is very important. The results of this study showed this possibility very clearly.

Finally, the succinct pattern relationship between Chinese foreign behavior and her attribute similarity and difference with others, discovered from this study, provides us with a nice theoretical framework with which we can estimate possible Chinese behavioral response to the hypothesized attribute differences. For example, if we suppose that China reaches the same power level as the U.S.A. in 1980 with other differences remaining the same, what would Chinese interaction with the U.S.A. look like? The models developed in this study will give the answer. The application of the models to this kind of simulation will contribute much for policy practitioners.

After all, the study reinforced my conviction that international relations can be fruitfully studied with a theory, and that this is the only way to obtain generalizable knowledge of a nation's foreign behavior.

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APPENDIX I-A

ORIGINAL DATA FOR NATION'S ATTRIBUTE

1955 AND 1963

1) UNIT, SOURCE AND FOOTNOTES FOR THE DATA

Common Footnotes

R: my estimation based on my own knowledge
D: DON (The Dimensionality of Nations Project) estimation
M: computer estimation (with MISDAT Program)
MA: my estimation based on M, above.
S..: substitution by the data of the year .. e.g. S56 means that the figure is of 1956.

NO.	VARIABLE NAME	CODE	UNIT	SOURCE AND FOOTNOTES
1	population	POPUL	x 10^4 persons	United Nations Yearbook
2	area	AREAT	x 10^3 km^2	United Nations Yearbook
3	density	DENST	persons in 1 km^2	POPUL/AREAT
4	arable land	ARLND	%	United Nations Yearbook. Footnote for '63: N = estimation by North (North, 1969).
5	energy production	ENPRO	x 10^5 metric tons	UN World Energy Supplies, 1960 for '55 and 1967 for '63. Footnote for '55: R estimates were based on Eckstein (1966) and Doolin and North (1967).
6	steel production	STPRO	x 10^3 ton	United Nations Yearbook, footnotes for '55 and '63: E = Eckstein (1966).
7	gross national product	GNPTL	x 10^2 million US$	DON data, footnote for '55: Eckstein estimated 375 for CHN.

(CONTINUED)

APPENDIX I-A

(CONTINUED)

ORIGINAL DATA FOR NATION'S ATTRIBUTE

1955 AND 1963

NO.	VARIABLE NAME	CODE	UNIT	SOURCE AND FOOTNOTES
8	literacy rate	LITRC	%	DON data
9	energy consumption per capita	ENCON	kg	same as ENPRO
10	telephone per capita	TELPH	x 10^{-5}	UN Statistical Yearbook, footnote for '55: S = S63.
11	population per physician	PHYSI	x 10	UN Statistical Yearbook, footnote for '55: S = S63.
12	GNP per capita	GNPPC	US$	GNPTL/POPUL
13	non-agricultural population	NAGPO	%	UN Statistical Yearbook, footnote for '55: S = S63.
14	geographical distance from China	GEODS	cm	distance between capitals on 30 cm. globe
15	size of armed forces	FORCE	x 10^3 persons	Coward, H. R. Military Technology in Developing Countries. Cambridge, Mass., 1967. Sellers, R. C. The Reference Handbook of the Armed Forces of the World, II., 1967. Footnote for '55: main source was Coward's. SL = Sellers. Footnote for '63: main source was DON. SL = Sellers, C = Coward.

(CONTINUED)

APPENDIX I-A

(CONTINUED)

ORIGINAL DATA FOR NATION'S ATTRIBUTE

1955 AND 1963

NO.	VARIABLE NAME	CODE	UNIT	SOURCE AND FOOTNOTES
16	number of combat airplanes	COMPL	number	main source: Sellers (1967). Footnote for '55: A = Asahi Nenkan, 1956.
17	defense expenditure	DEFEX	million US$	main sources: Coward (1967) for '55, and DON data for '63. Footnotes for both years: SL = Sellers.
18	bloc membership	BLOCM	0: Comm. 1: Neut. 2: West.	Don Data.
19	Communist Party membership	COMST	ratio to POPUL x 10^{-5}	DON data.
20	killed in domestic violence	KILLD	number	DON data.
21	killed in foreign violence	KILLF	number	DON data.
22	US aid	USAID	x 10^5 US$	DON data.
23	USSR aid	URAID	x 10^5 US$	Goldman, Marshall I. Soviet Foreign Aid. New York: Praeger, 1967. For Communist countries, p. 28, Table II-2, for other countries, pp. 204-5, Appendix I.

(CONTINUED)

APPENDIX I-A

(CONTINUED)

ORIGINAL DATA FOR NATION'S ATTRIBUTE

1955 AND 1963

NO.	VARIABLE NAME	CODE	UNIT	SOURCE AND FOOTNOTES
24	UN voting	UNVOT	0: yes 1: abstention & absence 2: no	UN Official Records of the General Assembly, Plenary Meetings. Footnotes for both years: R = the score if the nation had voted.
25	colonialism	COLON	0: colonized 1: no 2: possessed	Worldmark Encyclopedia
26	Roman Catholic	CATHL	%	DON data. Footnotes for both years: W = Worldmark Encyclopedia.
27	Protestant	PROTS	%	DON data. Footnotes for both years: W = Worldmark Encyclopedia.
28	Moslem	MOSLM	%	DON Data. Footnotes for both years: W = Worldmark Encyclopedia.
29	Buddhist	BUDDH	%	DON data. Footnote for both years: W = Worldmark Encyclopedia.
30	language	LANGN	number	DON data. Footnote for both years: W = Worldmark Encyclopedia.
31	Chinese population	CHINS	code (see def. in main text)	UN Demographic Yearbook.

(CONTINUED)

APPENDIX I-A

(CONTINUED)

ORIGINAL DATA FOR NATION'S ATTRIBUTE

1955 AND 1963

NO.	VARIABLE NAME	CODE	UNIT	SOURCE AND FOOTNOTES
32	freedom of group opposition	GOPPO	index	DON data.
33	trade with West. bloc	WTRAD	million US$	main source: DON data for '55 and IMF & IBRD. Direction of Trade; Annual 1961-65 for '63.
34	trade with Comm. bloc	CTRAD	million US$	main source: DON data for '55 and IMF & IBRD. Direction of Trade, Pryor (1963), Eckstein (1966) for '63.
35	trade direction index	ITRAD	x 10^{-3}	WTRAD/WTRAD + CTRAD

2) 1955 DATA

NATIONS	1 POPUL	2 AREAT	3 DENST	4 ARLND	5 ANPRO	6 STPRO	7 GNPTL	8 LITRC	9 ENCON	10 TELPH	11 PHYSI	12 INFPO	13 NUPO	14 GDDS
AF-TOT	1200	657	13	14	0	0	7	3	5	60	7000	58	165	150
AL-TOT	134	29	48	12	3	0	1MA	73	156	100	627	40*	105	145
AR-TOT	4912	2777	7	7R	73	29	72	87	682	5900	78	477	40	485
AU-TOT	900	7695	1	3	233	224	109	98	3545	17250	104	1146	84	220
AU-TOT	937	84	83	21D	103	182	37	93	1861	7270	68	691	78	180
BE-TOT	967	31	291	32	300	585	93	97	4084	9870	96	1049	40	199
BE-TOT	334	1049	3	3	5	OR	2	31	145	360	356	92	84	403
BR-TOT	6465	6512	7	2	40	116	53	49	289	1390	350	31	39	431
AU-TOT	753	111	68	39	55	7	22	65	788	810	400	235	45	176
BU-TOT	1866	675	29	13	3	OR	10	42	33	40	840	61	20	78
CA-TOT	410	191	25	11	0	0	23M	13	20	60	9000	70MA	30	81
CA-TOT	1570	9976	2	4	501	411	260	99	5279	26420	96	1695	64	252
CE-TOT	472	66	131	23	0	OR	11	64	87	320	590	126	475	125
CH-TOT	978	742	9	7	30	29	12	73	788	2210	140	177	62	465
CH-TOT	813	9761	62	10R	956R	285E	350R	44	1578	50	870	56	15	0
CH-TOT	891	36	248	24	26	4	16	44	383	470	153	161	50	43
CO-TOT	1269	1138	11	4	94	8	42	56	415	1290	290	332	47	362
CR-TOT	95	51	19	6	0	OR	3	73	214	1220	280	316	46	335
CU-TOT	613	115	53	17	1	3	22	76	643	2320	104	359	56	305
CZ-TOT	1330	128	102	42	472	447	71	93	3886	5570	74	643	75	176
DE-TOT	444	43	103	63	3	24	41	99	2496	20140	91	924	86	173
DO-TOT	253	491	52	14	6	OR	5	43	159	430	500	198	54	325
EC-TOT	369	271	14	4	6	OR	7	56	134	340	370	193	49	373
EG-TOT	2324	1000	23	3	24	10	31	25	243	660	350	134	29M	181
EL-TOT	213	21	104	27D	0	OR	5	42	104	460	600	228	35	325
ET-TOT	1210	1184	17	10D	0	OR	9	3	5	30	21000	45	13	200
FI-TOT	424	337	13	8	8	18	40	84	1184	10860	180	443	66	151
FR-TOT	4323	547	79	29	613	1259	452	97	2166	7200	110	1044	75	167
GE-TOT	1667	108	156	49	630	251	39	98	3878	6430	200	295	79	175
GM-TOT	5017	249	202	35	1661	2450	381	98	3257	7940	74	758	86	187
GR-TOT	797	132	60	27	4	OMA	20	76	341	1530	52	251	48	182
GU-TOT	525	109	30	14	0	OR	6	30	131	340	580	184	38	320
HA-TOT	531	28	119	13	0	OR	3	11	36	130	1060	81	10	323
HO-TOT	785	112	15	9	0	OR	2	34	126	450	640	120	24	324
HU-TOT	914	93	106	52	173	163	38	99	1508	1860	85	536	94S	173
IN-TOT	3383	3046	129	48	399	173	274	18	114	60	620	70	30	91
IR-TOT	1170	1492	55	12	188	OMA	105	9	115	90	7100	109	42	130
IR-TOT	2618	4648	11	10	215	OMA	21	13	159	300	440	115	20	134
IR-TOT	415	449	14	12	439	OR	10	13	259	610	590	153	25	150
IS-TOT	289	70	42	18	3	OMA	15	98	1289	3800	100	514	61	199
IS-TOT	375	21	93	17	0	OMA	9	93	1124	3780	40	515	82	172
IT-TOT	4389	301	159	52	104	540	212	77	721	4550	80	441	56	194
JA-TOT	9472	373	241	14	495	941	213	97	740	3510	100	239	69	91
JO-TOT	1..	60	15	9	0	OR	1	17	114	700	680	70	25M	170
[illegible]	942	121	78	19	29R	14	10MA	32	300R	6295	670	100MA	69R	20
KO-TOT	3252	98	220	21	14	1	1B	52	138	200	570	44	30A	25
LA-TOT	166	237	7	7	0	OR	1MA	30	7	30	33005	00MA	9S	69
LE-TOT	1.7	10	147	28	0	OR	4	47	476	2300	120	273	40S	167
LI-TOT	125	111	11	17	0	OR	2	8	22	291S	3000	160	19S	300
LU-TOT	111	1760	1	2	0	OR	1	8	184	630	1020	90	20S	208

APPENDIX I-A (cont'd)

STATIONS	1 POPUL	2 AREAT	3 DENST	4 ARLND	5 ENPRL	6 STPRO	7 GNPTL	8 LITRC	9 ENCON	10 TELPH	11 PHYSI	12 GNPPC	13 NATPO	14 GEOOS
WEAC91	3022	1973	15	10	213	51	55	46	642	1190	240	183	465	306
NEP262	956	141	61	28	3	CR	4	3	4R	20S	84030	47	5	76
NTH263	1075	34	316	25	135	98	76	33	2375	10340	100	707	86	196
NEW264	214	259	8	2	20	10MA	27	98	1876	22020	72	1244	81	255
NIC265	125	140	8	6	0	CR	3	37	151	300	260	241	30	328
NOR266	543	324	11	3	31	17	33	93	2431	17150	92	902	81	167
CUR267	83	1535	1	1R	4R	CR	2MA	57	461M	780	200	206M	25	34
PAN268	1458	947	57	26	8	1	46	14	42	60	1300	65	20R	84
PAN269	92	76	12	6	0	OR	3	72	386	2160	330	325	51	345
PAN270	157	407	4	1	0	OR	2	68	60	360	220	128	44	460
PER271	643	1285	8	1	34	5	13	42	274	640	450	148	34	426
PHI272	2376	300	74	21	2	OR	44	62	126	230	1200	136	31	98
POL273	2729	313	88	52	972	443	145	75	2621	1510	170	468	53	165
POR274	877	92	95	45	7	OMA	18	58	297	2530	140	205	58	230
RUM275	1733	238	74	42	258	77	54	77	1038	940	83	312	20R	158
SAU[illegible]	904	2253	3	0	618	OR	12	3	222	150	13005	249	15	158
SPA[illegible]	2738	505	53	40	145	122	74	76	606	2710	98	255	52	221
SWD278	726	450	16	8	30	215	85	98	2144	30570	130	1179	76	161
SWZ279	493	41	121	11	19	17	61	93	1425	24400	70	1226	84	192
SYR280	386	185	23	25	0	OR	4	27	191	900	400	104	40R	166
TAI281	2039	514	39	15	0	OR	21	54	50	50	480	103	34	80
TOG282	2407	781	31	22	42	19	65	35	224	620	340	270	28	163
UNS283	1349	1221	11	7	322	158	52	42	2387	4380	200	372	73	291
USA284	20722	22492	9	10	4408	4527	1500	81	2240	2983563	60	749	655	138
URU285	3121	244	210	29	2256	2011	511	93	4093	13340	120	908	94	194
USR286	9424	8649	21	24	12699	10617	3873	97	7763	33970	76	2334	97	247
URU287	262	147	14	12	1	1	15	85	455	4370	113	573	91	442
VEN288	598	512	5	3	1539	2	44	49	2123	1810	190	762	60	340
VTN289	1430	159	90	8	9R	11M	2CMA	13	65R	100R	1100	141M	25S	56
YUS290	1200	171	73	17	3	OR	16	72	37	130	6100	133	105	81
YEM291	460	135	23	18R	0	0	5M	3	5RE	20S	156255	80R	25S	178
YUG292	1759	256	69	32	89	81	52	75	596	910	260	296	27	178

APPENDIX I-4 (cont'd)

NATIONS	15 FORCE	16 COMPL	17 DEFEX	18 BLOCK	19 CONST	20 KILLD	21 KILLF	22 USAID	23 URAID	24 UNVOT	25 COLON	26 CATHL	27 PROTS	28 MOSLM
AFG3C1	430	0	15D	1	0	0	0	20	10	1	C	0	0	95
AL8002	420	C	56S63	0	3528	0	0	0	14	0R	0	10	0	73
ARG003	149	120	106	2	262	4370	0	62	0	2	1	94	2	0
AUL004	52	100	386	2	54	0	0	0R	0	2	2	23	65	0
AUS005	70	20	7D	1	1004	113M	24M	75	0	1R	0	90	6	0
BELC06	1400	300A	3130	2	169	0	0	0R	0	2	2	95R	2	0
BOL007	12	C	2	2	93	4	0	317	0	2	1	95	3	0
BRA008	107	300A	369S56	2	171	15	0	563	0	2	1	93	3	0
BUL009	1840	200	254S63	C	6068	0	0	0	139	0R	1	0	1	13
BUR010	43S55	10	70	1	42	268	83	1	0	0	0	1	1	8
CAM011	40S57	0	37S59	1	24	0	0	380	0	0R	0	0	0	2
CAN012	121S57	300	1710	2	48	0	0	0R	0	2	1	45	51	0
CEY013	20	0	6S56	2	27	10	0	1	0	0R	0	7	2	7
CHL014	42	70	93	2	592	0	0	62	0	2	1	90	4	0
CHN015	35530	2000	30540	0	1759	2000	2385	0	1414	0R	1	1	0	2
CHT016	530S56	200A	165S59	2	0	0	2385	1402	0	2	0	2	2	0R
COL017	170	20	65D	2	40	566	0	45	0	2	1	100	0	0
COS018	1	0	2	2	105	20	0	53	0	2	1	96R	1R	0
CUB019	230	10	51S57	2	490	555	0	5	0	2	1	91	5	0
CZE020	4430	300A	1030R	0	11374	4	0	0	33	0	0	75	13	0
DEN021	60	100	10R	2	383	0	0	0R	0	0	2	1	97	0
DOM022	9	20	23	2	0	0	0	3	0	2	1	98	2	0
ECU023	20	10	17	2	136	1	0	43	0	2	1	94	0	0
EGY024	92	200	147	1	9	5	4875	663	0	1	1	1	1	87
ELS025	7	0	7	2	4L	0	0	8	0	2	1	98	1	0
ETH026	230	0	27S59	1	0	0	0	41	0	2	0	0	95	0
FIN027	390	20	100R	1	766	0	0	0R	0	1R	1	0	95	0
FRN028	7530	1000A	2530D	2	867	0	4486	23	0	2	2	97	2	0
GME029	1140	200	1063SL	0	7145	0	0	0	0	0R	2	11	82	0
GMW030	1930	500	1030R	2	120	0	0	196	0	2R	2	45	51	0
GRC031	1370	200	185R	2	251	0	0	585	0	2	1	0	0	2
GUA032	8556	0	7	2	31	20	0	102	0	2	1	97	3	0
HAI033	5	0	5	2	0	53	0	125	0	2	1	99	0	0
HON034	4	0	3	2	30	38	35	19	0	2	1	98	2	0
HUN035	1730	90A	524R	0	8788	13391	13350	0	45	0R	1	68	27	0
IND036	3580	300	416	1	28	1672	16	1122	1	0	0	1	0	10
INS037	248S56	0	346	1	667	4177	0	24	0	0	0	1	3	90
IRN038	1310	75	49	1	33	127	0	1282	0	2	1	0	0	98
IRQ039	630	20A	80S56	2	42	55	0	29	0	2	1	4	0	94
IRE040	130	0	30R	1	3	0	0	0R	0	2R	0	94	5	0
ISR041	500	100	77	1	200	0	5228	53	0	1	0	1	0	7
ITA042	2690	400A	7330	2	3121	0	0	1032	0	2R	2	99	0	0
JAP043	197S56	100	437	2	101	0	0	605	0	2R	2	0	0	0
JOR044	200	10	30S56	2	365	0	263	89	0	2R	0	2	0	93
KOR045	5360	300	200R	0	12362	0	0	0	17	0R	0	0	0	0
KOS045	650S56	150A	120	2	0	0	0	3150	0	2R	0	1	4	0
LAO047	25S56	0	11S59	1	235	135M	82M	236M	0	0R	0	0	0	0
LEB048	50	20	8	1	546	23	0	77	0	2	0	49	0	50
LBR049	4559	0	1559	1	0	0	0	169	0	2	1	1	50R	0R
LBY050	20	0	4559	2	27	247M	0MA	135	0	1R	0	3	0	96

APPENDIX I-A (cont'd)

NATIONS	15 FORCE	16 COMPL	17 DEFEX	18 BLOCK	19 CONST	20 KILLD	21 KILLF	22 USAID	23 URAID	24 UNVOT	25 COLON	26 CATHL	27 PROTS	28 MOSLM
PER051	48	20	35	2	17	28	0	51	0	?	1	98	1	0
NEP052	20S56	0	20	1	21	0	0	26	0	0R	1	0	0	1M
NTH053	300D	240	530R	2	233	0	0	0R	0	2	2	39	42	0
NEW054	110	20	650	2	19	0	0	0R	0	2	2	14	74	0
NIC055	4S57	20	4S59	2	40	0	35	36	0	2	1	96	4	0
NOR056	330	800A	1220	2	233	0	0	0R	0	0	1	0	99	0
OLY057	20SL	0	25SL	0	3610	0	0	0	27	0R	1	0	0	0R
PAK058	190S56	150	172	2	2	3	20	1107	0	2	C	0	0	86
PAN059	3S59	0	1S59	2	54	0	0	29	0	2	1	93	6	0
PAR060	6	0	3S57	2	128	10	0	97	0	2	1	96	2	0
PER061	18	70	33	2	53	0	0	1099	0	2	1	99	1	0
PHI062	42S56	40	48	2	21	5	0	308	0	2	0	83	10	4
POL063	300D	500	2200	0	5278	140	0	0MA	888	C	1	98	1	0
POR064	730	70	610	2	34	0	0	396M	0	1R	2	97	0	0
RUM065	250D	200	908	0	3437	0	0	0	178	0R	1	17	6	0
SAU066	30	0	150S58	1	0	0	0	3	0	1	1	0	0	95
SPN067	5000	350	2100	2	17	0	0	1158	0	2R	2	99W	0M	0
SWD068	740	600A	710R	1	379	0	0	0R	0	0	1	2	94	0
SWZ069	50	500A	1750	1	121	0	0	0R	0	1R	1	42	56	0
SYR070	450	90	23	1	259	13	56	2F0M	0	1	1	3	0	67
TAI071	450	120	41	2	25	0	0	485	0	2	1	0	0	4
TUN072	423D	300A	366	2	0	0	0	1093	0	2	1	0	0	98
UNS073	90	70	61	2	11	69	0	163M	0	2	2	5	57	1
USR074	43500	100D0	100D0R	0	3604	50	13350	0	0	0	1	5	86	1
UNR075	900	200D	4762S56	2	66	0	4509	350	0	2	2	9	90	0
USA076	3214D	20000A	40700	2	0R	0	0	0	0	2	2	22	33	0
URA077	6	0	24D	2	191	0	0	4	0	2	1	85	1R	0
VEN078	17	40	103	2	173	22	0	2	0	2	1	95	1	0
VTN079	210R	0	150R	0	3141	231M	327 M	0	0	0R	0	4	0	0
VTS080	150S56	20	173S58	2	14	199M	245M	368M	0	2R	0	16	0	0
YEM081	180	0	18RE	1	0	0	23	0MA	0	1	1	0	0	95
YUG082	556D	500	5E60	1	3457	103M	0	1434	0	0	1	32	1	12

APPENDIX I-A (cont'd)

NATIONS	29 BUDDH	30 LANGH	31 CHINS	32 COPPG	33 WTRAD	34 CTRAD	35 ITRAD
AFG001	0	4	0	0	28	2M	892M
ALB002	0	2	0	0	1	0	800
ARG003	0	1	0	1	1240	218	850
AUL004	0	1	4	2	2648	63	977
AUS005	0	1	0	2	1115	194	852
BEL006	0	2	0	2	3847	192	952
BGL007	0	4	0	2	145	0	300
BRA008	0	2	0	2	1502	173	897
BUL009	0	3	0	0	33	30	917
BUR010	83	3	5	2	116	49	703
CAN011	90	4	6	2	4	23M	861M
CAN012	0	5	4	2	8006	23	997
CEY013	64	2	0	2	390	3	992
CHL014	0	1	0	2	562	5	992
CHN015	26	4	8	0	168	7	961
CHT016	20R	3	7	1	130	0	999
COL017	0	1	0	0	1002	5	995
COS018	0	2	2	2	121	0	998
CUB019	0	1	4	1	879	43	953
CZE020	0	2	0	0	261	43	857
DEN021	0	1	0	2	1656	134	925
DOM022	0	2	2	1	178	1	997
ECU023	0	2	0	2	135	0	998
EGP024	0	3R	0	1	475	163	745
ELS025	0	1	0	2	147	0	997
ETH026	0	8R	0	0	72	1	999
FIN027	0	2	0	2	868	403	683
FRN028	0	1	0	2	4011	320	926
GME029	0	1	0	0	161	44	794
GMB030	0	1	0	2	6377	576	988
GRC031	0	2	0	2	429	40	915
GUA032	0	2	2	1	192	0	999
HAI033	0	2	0	2	67	1	947
HON034	0	2R	2	1	79	0	995
HUN035	0	2	0	0	186	18	911
IND036	0	11R	3	2	1681	52	970
INS037	3	2	6	1	746	67	917
IRN038	0	10M	0	0	402	31	927
IRQ039	0	3	0	1563	529	10	981
IRE040	0	1	0	2	754	15	990
ISR041	0	2	0	2	300	30	909
ITA042	0	1	0	2	2384	243	908
JAP043	45	1	4	2	2287	141	942
JOR044	0	3R	0	2	17	13M	961M
KON045	40R	1	4	0	3	97	31
KOS046	40R	1	4	2	172	1	997
LAO047	90R	5R	3	2	24563	0563	857M
LEB048	0	7R	0	2	141	11	929
LBR049	0	5	0	2	43	GMA	922M
LBY050	0	2	0	2	33	5M	938M

APPENDIX I-A (cont'd)

NATIONS	29 HUDOM	30 LANGN	31 CHINS	32 GOPPO	33 WTRAD	34 CTRAD	35 ITRAD
MEX051	0	2	3	2	1341	2	998
NEP052	50R	3	0	1	0P	0R	500R
NTHC53	0	1	0	2	3930	221	946
NEWC54	0	2	3	2	1268	9	993
NICO55	0	3	0	2	102	0	999
NOR056	0	1	0	2	1124	106	914
CUT057	85	1R	0	0	0R	3M	0R
PAK058	0	6	0	2	355	9	976
PANC59	0	2	3	2	74	0R	1000R
PARC60	0	2	0	0	28	0	996
PER061	0	3	0	2	383	2	995
PHI062	0	8	5	2	721	0	999
POLC63	0	2	0	1	370	63	854
PORO64	0	1	0	0	399	9	977
RUMC65	0	3	0	0	100	34	749
SAU066	0	1	0	0	478	1	998
SPN067	0	3	0	0	571	13	977
SWD068	0	1	0	2	2897	206	932
SWZ069	0	4	0	2	1995	122	943
SYR070	0	4R	0	2	184	11	943
TAI071	94	2R	5	GS63	289	0	999
TUR072	0	3	0	2	504	196	720
UNS073	0	11	3	2	1540	21	986
USR074	1	11R	3	0	536	320	647
UNK075	0	1	3	2	9474	874	916
USA076	0	1	5	2	12518	304	976
URA077	0	1	0	2	246	20	924
VEN078	0	1	0	2	1740	4	998
VTN079	50R	3R	5	1	0MA	11M	750M
VTS080	50R	3R	5	1	2039MA	0MA	969M
YEM081	0	1	0	0	0MA	0MA	892M
YUG082	0	7	0	0	475	70	872

APPENDIX I-A (cont'd)

3) 1963 DATA

NATIONS	1 POPUL	2 AREAT	3 DENST	4 ARLND	5 EMPRO	6 STPRO	7 GNPTL	8 LITRC	9 ENCON	10 TELPH	11 PHYSI	12 GNPPC	13 NAGRO	14 GECDS
AFG021	1534	657	23	224	1	OR	11	3	29	58	3200	80	15	100
ALB022	176	29	61	17	11	OR	4M	72	323	341	320	206M	10	185
ARG023	2169	2777	8	7	239	94	129	94	1137	6573	67	614	72	465
AUL024	1092	7695	1	4	323	464	181	98	4196	23373	88	1679	90	220
AUS025	717	84	86	20	103	295	75	98	2541	12078	55	1041	98	180
BEL026	929	31	304	29	215	753	140	96	4647	14682	72	1360	90	199
BEL027	360	1099	3	11M	6	OR	6	33	161	528	360	154	33	423
BRA028	7752	8512	9	12M	109	281	152	47	366	1573	250	196	48	421
BUL029	893	111	73	41	123	46	49	99	1960	2795	67	637	25	176
BUR010	2374	673	35	22	9	OR	17	57	48	88	960	72	20	78
CAM011	584	181	33	16	0	OR	8	17	47	68	2500	127	19	81
CAN012	1392	9974	2	4	1117	743	392	97	6556	35127	96	2076	99	252
CEY013	1059	66	162	23	0	OR	15	62	114	387	440	142	47	125
CHL014	822	742	11	8M	68	49	39	87	1109	2859	140	483	72	465
CHN015	69030	9761N	72	10N	2844	1200E	420R	47	4198P	100	19764	62	22	9
CHT016	1170	36	325	25	51	22	20	58	573	1137	170	169	54	43
COL017	1696	1138	13	4	154	21	47	52	533	2196	240	292	54	362
COS018	134	51	27	12	1	OR	5	91	251	1492	220	377	49	335
CUB019	724	115	63	24M	0	20MA	28MA	77	906	3054	120	381M	58	305
CZE020	1395	128	109	42	740	760	115R	97	5631	9319	54	823	82	178
DEN021	464	43	109	65	8	36	76	98	3714	24656	81	1620	75	173
DOM022	334	49	68	23M	0	OR	9	42	177	828	679R	269	30	325
ECU023	481	271	17	11	5	OR	9	81	176	915	260	199	30	373
EGP024	2797	1000	28	3	74	28MA	39	55	298	944	260	135	38	181
ELS025	272	21	127	24	0	OR	7	69	152	772	480	261	38	325
ETH026	2140	1184	18	8	0	OR	9	2	9	82	5600	47	10	200
FIN027	454	337	13	8	10	31	54	98	2070	16057	150	1196	78	151
FRN028	4785	547	87	29	648	1756	766	96	2833	11152	91	1601	82	197
GMB029	1009	108	149	46	789	363	344	98	5324	9416	200S	214	79	175
GMC030	5543	249	224	34	1894	3160	915	98	4128	13711	67	1652	92	187
GRC031	848	132	64	30	13	20MA	43	86	551	4158	79	937	53	182
GUA032	413	109	38	20	0	OR	12	27	171	478	480	183	25	320
HAI033	423	28	160	30	0	OR	4	12	30	94	1100	80	17	323
HON034	214	112	18	7	0	OR	4	70	165	420	1003R	206	33	324
HUN035	1003	93	108	60	202	2374	70	98	2584	5025	61	696	64	173
IND036	50449	3046	151	53	701	5971	400	53	168	148	680	94	28	91
INS037	10004	1492	67	15M	335	30MA	81	66	111	148	4100	80	20	130
IRQ038	7213	1648	13	10	967	20MA	48	51	453	726	340	716	40	134
IRE039	770	449	15	26	746	OR	16	56	441	775	450	228	45	150
ISR040	244	72	40	19	25	10MA	22	98	2232	6756	95	764	66	199
ISR041	233	21	115	19	2	10MA	26	90	1485	7815	40	1111	87	172
ITA042	5064	301	168	51	194	1016	419	92	1564	9939	61	830	73	194
JAP043	9590	370	259	15	643	3150	592	97	1531	8730	90	617	75	91
JOR044	133	90	20	12	0	OR	4	65	260	1346	590	199	65	170
KOR045	1150	121	89	27R	140	122	64M	84	1221R	636	670S	314M	56	20
KUS046	2687	98	273	21	80	15	31	84	390	636	290	114	43	25
LAO047	251	237	8	4	0	OR	2	17	39	40	3800	97	5	68
LEB048	229	10	212	30	0	OR	8	47	611	4167	100	393	40	167
LIB049	103	111	9	37	0	OR	2	37	170	291	1600	170	19	300
LUX050	150	1760	1	1	287	OR	5	7	286	800	580	359	20	208

APPENDIX I-A (cont'd)

NATIONS	1 POPUL	2 AREAT	3 DENST	4 ARLND	5 EMPRD	6 STPRD	7 GNPTL	8 LITRC	9 ENCON	10 TELPH	11 PHYSI	12 GNPPC	13 MAGPD	14 GECDS
MEXU51	3287	1973	19	12	379	197	154	80	939	1693	180	402	46	300
NEPD52	973	141	69	28	9	OR	6	3	5	20	7200	59	5	75
NTHD53	1197	34	356	29	152	234	139	98	3199	16900	89	1159	90	185
NEND54	254	269	9	3	24	106M	44	98	2052	35512	69	1720	84	255
NICD55	154	140	11	13	0	OR	5	69	743	909	280	301	40	326
NORD56	367	324	11	3	53	54	56	98	3151	22834	83	1516	81	167
CUTD57	103	1535	1	1R1	8	10MA	3MA	98	744R	165	55	244M	29	28
PAKD58	9863	947	104	27	33	1	88	52	79	109	1100	81	25	94
PAND59	117	76	16	8	0	OR	5	83	910	3333	250	488	52	345
PARD60	191	407	5	2	0	OR	4	80	102	691	170	193	25	450
PERD61	1096	1285	9	1	55	7	28	92	562	1250	170	262	42	405
PHID62	3624	300	101	37	3	20MA	40	83	190	484	507R	134	56	68
POLD63	3069	313	98	51	1194	800	192	97	3431	3548	94	564	55	165
PORD64	904	92	98	45	10	22	29	73	459	5365	120	322	58	230
RUMD65	1391	238	79	44	405	270	117M	92	1801	2004	70	432M	27	168
SAUD66	660	2253	3	0	1054	OR	11	3	279	409	1300	175	15	158
SPND67	3108	505	62	41	169	243	151	90	988	7257	82	497	62	221
SWDD68	760	450	17	7	49	390	150	98	3575	40184	100	1977	86	161
SWZD69	577	41	140	10	27	32	112	98	2548	34627	75	1924	89	192
SYRD70	509	185	28	48	0	OR	8	64	289	1360	520	167	44	166
TAID71	2384	514	56	30	1	14MA	31	32	84	191	1000	106	18	80
TURD72	2389	781	39	33	62	33	72	62	299	957	570	238	35	169
UNSD73	1704	1221	14	10	425	283	93	57	2464	6279	200	545	56	281
USFD742247B		22402	10	10	8071	8020	1876	99	3233	2893	50	898	65	138
UNK375	5380	244	221	30	2006	2288	829	98	5093	17234	56	1552	95	196
USAC7618942		9363	20	20	15164	9912	5770	99	8508	44584	76	3043	92	267
URAD77	265	187	14	12	1	7MA	14	93	829	6377	87	478	85	460
VENB78	814	912	9	3	2287	30MA	60	83	2752	2561	140	728	69	349
VTND79	1780	159	112	8	34	20MA	23MA	80	193R	137	1100S	183M	25	56
VTSD80	1532	171	90	18	1	10MA	17	90	61	137	2900	114	10	81
YEMD81	560	195	26	16	0	0	5MA	2	7	20	15625	90	25	178
YUGD82	1906	256	75	32	177	159	58	85	1025	1689	140	303	50	178

APPENDIX I-A (cont'd)

NATIONS	15 FORCE	16 COMPL	17 DEFEX	18 BLOCK	19 CONST	20 KILLD	21 KILLF	22 USAID	23 USAID	24 UNVOT	25 COLON	26 CATHL	27 PROTS	28 MOSLM
AFGJ01	100	106	13	1	0	0	0	174	239	0	1	9	0	99M
ALB002	45	60	56	0	3011	0	0	0	0M	0	1	5	0	73M
ALGJ03	115	140	256	2	207	36	0	997	0R	2	1	39	0	0
ALL004	86	304	913	2	54	0	0	0	0	2	2	21	67R	0
ALS005	24	20	101	1	488	0	0	0	0	1	1	89	6	0
BEL006	100	374	462	2	118	0	0	0	0	2	2	95	2	0
BCL007	20	3	0	2	166	8	0	356	0R	2	1	94	3	0
BRA008	150	84	314	2	40	9	0	865	0R	2	1	93	5R	0
BUL009	120	150R	254	0	6262	0	0	0	787	0	1	1	0M	19M
BUR010	165	48	102	1	21	1200	0	153	9	0	1	1	1	8
CAM011	35	46	45	1	0	0	3	200	136M	0	0	1	0	2
CAN012	126	424	1457	2	21	3	0	0	0	2	1	43	50R	0
CEY013	0	0SL	15	1	47	0	0	4	29	0	1	7	2	7
CHL014	43	35	59	2	304	5	0	413	0R	2	1	90	4	0
CHN015	2421	2250	9510	0	2647	200	157	0	146	0R	1	1	0	2
CHI016	542	395	218	2	0	0	157	386	0	2	1	2	2M	1M
CCL017	32	10	110	2	65	2090	0	935	0R	2	1	97	1M	0
CCS018	1	0	2	2	0	0	0	130	0R	2	1	96	1M	0
CUB019	65	136	230	0	387	500	0	0	579	0	1	84	1R	0
CZE020	220	680	1420SL	0	11641	0	0	0	105	0	1	63	10R	0
DEN021	100	170	218	2	107	0	0	0	0	0	2	1	97	0
DOM022	19	47	34	2	0R	30	0	296	0	2	1	95	2	0
ECU023	9	28	17	2	42	8	0	182	0R	2	1	94	0	0
EGP024	156	400	237	1	4	0	30	496	481	0	1	1	1	87
ELS025	3	3	8	2	37	1	0	196	0R	2	1	98	1	0
ETH026	43	20	22	1	0	100	0	100	0R	0	1	1	4S	0
FIN027	42	38	119	1	881	0	0	0	0	0	1	0	95	0
FRN028	827	1027	3767	2	543	0	0	0	0	2	2	83	2	0
GME029	523	391	1245	0	10012	0	0	0	114	0R	1	11	82	0
GMW030	414	1353	4360	2	90	0	0	0	0	2R	1	48	50R	0
GRC031	145	325	155	2	236	0	0	316	0R	2	1	1	0	2
GUA032	12	22	9	2	24	2	0	33	0R	2	1	93	3	0
HAI033	5	6	7	2	0R	200	0	21	0R	2	1	80	0	0
HON034	4SL	40	8	2	93	8	0	73	0R	2	1	97	2	0
HUN035	81	165	526	0	5150	0	0	0	178	0	1	58	25R	0
IND036	5960	540	990	1	26	914	0	4022	814	0	1	2	0	11
INS037	365	340	1200	1	1899	57	42	367	97	0	1	1	3	96
IRN038	180	235	226	2	9	584	0	234	0MA	2	1	0	0	98
IRQ039	70	102	139	1	218	1655	0	8	259	0	1	3	0	95
IRE040	13SL	10	30	1	0	0	0	0	0	2	1	94	5	0
ISR041	250	257	182	1	94	0	7	450	0	1	1	2	1	8
ITA042	480	600	1283	2	2666	9	0	0	0	2	1	100	0	0
JAP043	246	572	599	2	118	0	0	0	0	2	1	0	0	0
JOR044	50	7	51	1	0	44	4	427	0	2	1	3	1	94
KOR045	369	470	200	0	11304	0	2	0	137	0R	1	1	0	0
KOS046	531	190	153	2	0	0	0	1278	0	2R	1	2	5M	0
LAO047	110	65	17	1	0	1120	0	381	113M	0	0	1	0	0
LEB048	10	22	25	1	179	0	3	1	0R	1	1	41	0	50R
LBR049	6	0	2	1	0	0	0	399	0R	2	1	1	50R	0R
LBY050	5	9	17	1	0	0	0	113	0R	2	0	3	0	96

APPENDIX I-A (cont'd)

NATIONS	15 FORCE	16 CONFL	17 DEFEX	18 BLOCS	19 CONST	20 KILLD	21 KILLF	22 USAID	23 URAID	24 UNVOT	25 COLON	26 CATHL	27 PROTS	28 MOSLM
PER051	62	29	101	2	130	3	0	3	OR	2	1	94	1	0
AEP052	33	0	5	1	41	50	0	39	80MA	0	1	0	0	1M
ATH053	124	287	641	2	100	0	0	0	0	1	2	40	42R	0
AEH054	23	20	74	2	39	0	0	0	0	2	2	14	74R	0
AICG55	7	25	8	2	0	2	0	35	OR	2	1	94	4R	0
AGH056	37	220	193	2	109	0	0	0	0	0	1	0	99	0
CUT057	20SL	6	25	0	451	0	0	0	299	0	1	0	0	0
PAK058	253C	169	159	2	3	133		1861	43	0	1	0	0	88
PAN05	3	0	0	2	0	0	0	88	OR	2	1	72	6M	0
PAR060	16	0	12	2	209	2	0	30	OR	2	1	93	2	0
PER061	49	69	73	2	73	10	0	29	OR	2	1	96	1	0
PHI062	49	44	70	2	7	0	0	33	0	2	1	76	19	4
POL063	370	830	9175	0	4806	0	0	0	301	0	1	97	1	0
POR064	108	156	150	2	22	0	0	0	0	1	2	92	0	0
RUM065	222	272	685	0	6592	0	0	0	355	0	1	10	6	0
SAU066	32C	18	113	1	0	0	30	0	20MA	1	1	0	0	95
SPN067	405	350	369	1	16	0	0	0	0	2	2	100	0	0
SWD068	33	1059	710	1	263	0	0	0	0	0	1	1	95R	0
SWZ069	700	344	305	1	104	0	0	0	0	1R	1	40	55R	0
SYR070	60	87	100	1	80	82	3	2	17	0	1	3	0	67
TAI071	75	120	77	2	0MA	0	0	174	0	2	1	0	0	4
TUR072	409	725	284	2	3	28	0	1308	1	2	1	0	0	99
UAS073	25C	75	179	1	6	44	0	0	0	2	2	6	57	1
USS074	3300	12300	15444	0	4894	212	2	0	0	0	1	4	86555	1
UNK075	623	1286	1309	2	63	0	0	0	0	0	2	8	99	1
USA076	2718	8250	53429	2	0R	3	2	0	0	2	2	23	33	0
URA077	3	7	17	2	377	0	0	79	OR	2	1	85	1R	0
VEN078	33	83	135	2	369	145	0	331	OR	2	1	93	1	0
VTN079	420	123	300	1	3371	0	0	0	244	OR	1	3	0	0
YTS080	400	126	267	2	130	36010	3	1433	0	2R	0	9	0	0
YEM081	13C	12	10	1	0	1003	0	56	1	0	1	0	0	95
YUG082	400	500555	403	1	5430	0	0	1	34	0	1	32	1	12

APPENDIX I-A (cont'd)

NATIONS	29 BUDDH	30 LANGH	31 CHRS	32 GOPPO	33 WTRAD	34 CTRAD	35 ITRAD
AFG001	0	4	0	0	96	98	496
ALB002	0	2	0	0	11	1034A	524M
ARG003	0	1	0	2	1719	71	960
AUL004	0	1	4	2	3913	319	924
AUS005	0	1	0	2	2070	404	836
BEL006	0	2	0	2	7776	213	973
BCL007	0	4	0	2	166	1	992
BRA008	1	2	0	2	2049	171	922
BUL009	0	3	0	0	98	1112	80
BUR010	85M	3	5	1	261	75	777
CAM011	90M	4	6	0	108	32	771
CAN012	0	5	4	2	10743	328	970
CEY013	64M	2	0	2	390	99	797
CHL014	0	1	0	2	895	17	981
CHN015	26M	4	8	0	831	1191	410
CHT016	20R	3	7	0	533	0	1000
CCL017	0	1	0	2	769	9	988
CCS018	0	2	2	2	186	0	998
CUB019	0	1	4	0	221	506M	693M
CZE020	0	2	0	0	527	2964	191
DEN021	0	1R	0	2	2784	171	942
DOM022	0	2	2	2	300	1	997
ECU023	0	2	0	2	251	1	998
EGP024	0	3	0	0	706	398	639
ELS025	0	1	0	1	225	1	996
ETH026	0	8	0	0	141	8	945
FIN027	0	2	0	2	1409	503	736
FRN028	0	1	0	2	9488	565	943
GMF029	0	1	0	0	261	1785	127
GMY030	0	1	0	2	17044	1002	944
GRC031	0	2	0	2	710	127	847
GUA032	0	2	2	2	260	0	1000
HAI033	0	2	0	0	71	0	994
HON034	0	2	2	2	134	2	987
HUN035	0	2	0	0	393	1617	195
IND036	1	11	4	2	2707	425	856
INS037	3	2	6	1	796	0	1000
IRN038	0	10W	0	2	911	91	900
IRQ039	0	3	0	1	792	76	912
IRE040	0	1	0	2	1174	16	986
ISR041	0	12	0	2	746	23	970
ITA042	0	1	0	2	7580	764	908
JAP043	4S	1	4	2	7136	523	931
JOR044	0	3	0	2	79	15	835
KEN045	20R	1	4	0	36564	1164	30
KOS046	35R	1	4	1	587	0	1000
LAO047	90R	5	3	1	24	0	995
LEB048	0	3	0	2	245	77	760
LBR049	0	5	0	0	413	0	1000
LBY050	0	2	0	0	529	13	976

APPENDIX I-A (cont'd)

NATIONS	29 BUDGH	30 LABGH	31 CHINS	32 GOPPO	33 YTRAD	34 CTRAD	35 ITRAD
PERC51	0	2	3	1	1492	7	996
NEP052	50R	3	0	0	0	0	500R
NTH053	0	1	0	2	8129	249	970
NEW054	0	2	3	2	1368	9	994
NIC055	0	3	0	1	194	0	994
NOR056	0	1	0	2	1872	104	947
OUT057	85	1	0	0	0MA	100MA	0MA
PAK058	1	6	0	1	989	46	955
PAN059	0	2	3	2	139	0	998
PAR060	0	2	0	1	32	0	1000
PER061	0	3	0	1	890	10	989
PHI062	0	8	5	2	1269	0	1000
POL063	0	2	0	0	962	2363	267
POR064	0	1	0	0	620	11	982
RUM065	0	3	0	0	402	1526	208
SAU066	0	1	0	0	995	0	1000
SPN067	0	3	0	0	1822	108	944
SWD068	0	1	0	2	5017	313	941
SWZ069	0	4	0	2	4422	273	941
SYR070	0	4R	0	1	201	87	697
TAI071	94	2	5	0	697	9	986
TUR072	0	3	0	2	786	86	901
UKS073	0	11	4	1	2309	27	988
USR074	0	11	4	0	2144	7445	223
UNK075	0	1	4	2	12460	965	926
USA076	0	1	5	2	23421	235	987
URA077	0	1	0	2	223	18	923
VEN078	0	1	0	2	2430	6	997
VTNC79	50R	3	5	0	0	400MA	0
VTS080	50R	3	5	0	289	0	1000
YEMC81	0R	1	0	0	4	0	1000
YUG082	0R	7	0	0	982	454	683

APPENDIX I-B

ORIGINAL DATA FOR CHINA'S FOREIGN BEHAVIOR

1955 AND 1963

1) UNIT, SOURCE AND FOOTNOTES FOR THE DATA

NO.	VARIABLE NAME	CODE	UNIT	SOURCE AND FOOTNOTES
1	export	EXPOR	x 10^5 US$	Eckstein (1966), Table 4-1, B-1, and B-3. Figures were cross-checked against IMF & IBRD. Direction of International Trade, Annual Issues.
2	import	IMPOR	x 10^5 US$	same as above.
3	economic aid	ECAID	x 10^5 US$	匪情年報, 1967, アジア政經學會編, 中國政治經濟綜覽, Tokyo, 1964. Footnote for '55: E = Eckstein.
4	diplomat from Peking	DIPFP	index	大公報外刊, 人民手册 and Doolin and North (1967).
5	diplomat to Peking	DIPTP	index	same as above.
6	treaties	TREAT	number	大公報社刊, 人民手册.
7	co-membership in NGO	CONGO	number	世界知識年鑒, and Yearbook of International Organizations.
8	official political visit to object	POFVT	frequency	人民日報
9	official political visit from object	POFVF	frequency	人民日報

(CONTINUED)

APPENDIX I-B

(CONTINUED)

ORIGINAL DATA FOR CHINA'S FOREIGN BEHAVIOR

1955 AND 1963

NO.	VARIABLE NAME	CODE	UNIT	SOURCE AND FOOTNOTES
10	non-official political visit	PNOVT	frequency	人民日報
11	economic visit to object	ECOVT	frequency	人民日報
12	economic visit from object	ECOVF	frequency	人民日報
13	cultural visit to object	CULVT	frequency	人民日報
14	cultural visit from object	CULVF	frequency	人民日報
15	concern	CONCN	index (see def. in main text)	人民日報
16	positive communication	POCOM	index	人民日報
17	negative communication	NECOM	index	人民日報

2) 1955 DATA

APPENDIX I-B (cont'd)

OBJECT NATIONS	1 EXPGR	2 IMPGR	3 BCAID	4 DIPPP	5 DIPTP	6 THRAT	7 CONGO	8 POPVT	9 POPVP	10 PROVT	11 ECOVT	12 ECOVP	13 CULVT	14 CULVP
AFG001	34A	0R	0	10	5	0	4	0	0	0	0	0	0	0
ALB002	13	0	40E	11	11	2	11	0	0	1	0	0	3	2
ARG003	3	10	0	0	0	0	14	0	0	2	1	0	0	1
AUL004	41	63	0	0	0	0	14	0	0	2	0	0	0	0
AUS005	11	18	0	0	0	0	14	0	0	0	0	0	0	0
BEL006	19	70	0	0	0	0	13	0	0	3	0	0	2	0
BCL007	0R	0R	0	0	0	0	10	0	0	1	0	0	0	0
BRA008	0	46	0	0	0	0	14	0	0	1	0	0	0	0
BUL009	43	46	0	15	15	6	18	0	0	1	0	2	0	15
BUR010	22	175	0	15	15	3	9	0	1	3	2	3	3	3
CAN011	36M	36M	112S56	0	0	0	3	0	0	0	0	0	0	0
CAN012	30	10	0	0	0	0	14	0	0	0	0	0	0	0
CEY013	158	255	0	5	5	3	14	0	0	0	0	1	0	0
CHL014	0	0	0	0	0	0	15	0	0	2	0	0	0	0
CHT016	19	0	0	0	0	0	3	0	0	0	0	0	0	0
COL017	3	9	0	0	0	0	13	0	0	2	0	0	0	0
COS018	0R	0R	0	0	0	0	9	0	0	0	0	0	0	0
CUB019	4	0R	0	0	0	0	10	0	0	0	0	0	0	0
CZE020	607	576	0	15	15	4	19	1	1	3	0	1	4	6
DEN021	2	1	0	15	15	0	15	0	0	0	0	0	1	2
DOM022	0R	0R	0	0	0	0	5	0	0	0	0	0	0	0
ECU023	0R	0	0	0	0	0	12	0	0	0	0	0	0	0
EGP024	8	245	47S56	0	0	4	12	0	0	0	0	1	1	3
ELS025	0R	0R	0	0	0	0	5	0	0	0	0	0	0	0
ETH026	0	0	0	0	0	0	4	0	0	0	0	0	0	0
FIN027	39	125	0	14	14	1	14	0	0	0	1	0	1	2
FRN028	111	72	0	0	0	0	16	0	2	3	1	1	1	4
GMF029	867	974	0	15	15	7	15	2	1	4	0	1	1	12
GMA030	431	262	0	0	0	0	13	0	0	0	0	0	0	0
GRC031	1	0	0	0	0	0	12	0	0	0	0	0	0	0
GUA032	0R	0R	0	0	0	0	10	0	0	0	0	0	0	0
HAI033	0	0	0	0	0	0	4	0	0	0	0	0	0	0
HON034	0P	0R	0	0	0	0	7	0	0	0	0	0	0	0
HUN035	290	365	75S56	15	15	3	16	1	0	1	1S	2	1	5
IND036	76	191	0	15	15	1	19	1	1	3	0	2	2	13
INS037	93	62	112S56	15	12	2	10	1	1	3	0	2	0	0
IRQ038	0	0	0	0	0	0	14	0	0	2	0	0	0	0
IRE039	0	0	0	0	0	0	12	0	0	1	0	0	0	0
IRE040	0	0	0	0	0	0	8	0	0	0	0	0	0	0
ISR041	0	0	0	5	5	0	15	0	0	0	0	1	0	0
ITA042	39	57	0	0	0	0	14	0	0	3	0	0	1	0
JAP043	760	285	0	0	0	4	17	0	2	15	2	9	2	10
JOR044	0	0	0	0	0	0	6	0	0	2	0	0	0	0
KEN045	580M	673M	5C0E	15	15	4	13	1	0	1	0	1	1	4
KOS046	0R	0R	0	0	0	0	6	0	0	0	0	0	0	0
LAO047	43M	19M	0	0	0	0	2	0	0	0	0	0	0	0
LEB048	2	0	0	0	0	1	16	0	0	3	0	0	0	0
LBR049	0P	0R	0	0	0	0	1	0	0	0	0	0	0	0
LBY050	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX I-B (cont'd)

OBJECT MATRIXS	1 EXPOR	2 IMPOR	3 ECAID	4 DIFFP	5 DIFTP	6 TREAT	7 CONSO	8 FOPVT	9 FOPVP	10 PROVT	11 ECOVT	12 ECOVP	13 GULVT	14 GULVP
MEX051	0	0	0	0	0	0	15	0	0	2	0	0	0	0
NEP052	OR	OR	42556	10	5	0	4	1	0	0	0	0	1	0
NTH053	76	29	0	10	11	0	12	0	0	1	0	0	0	0
NEW054	9	4	0	0	0	0	9	0	0	3	0	0	0	0
NIC055	OR	OR	0	0	0	0	4	0	0	0	0	0	0	1
NCR056	18	23556	0	10	10	0	12	0	0	0	0	0	4	3
CUT057	264P	315M	100556	15	15	2	13	0	0	2	0	0	3	0
PAK058	4	317	0	0	0	0	10	0	0	1	0	0	0	0
PAN059	3R	3R	3	0	0	0	8	0	0	0	0	0	0	0
PAR060	OR	OR	0	14	14	0	11	0	0	0	0	0	0	0
PER061	0	0	0	0	0	0	13	0	0	0	0	0	0	0
PHI062	OR	OR	0	0	0	0	7	0	0	0	0	0	0	0
POL063	356	359	0	15	15	4	19	2	0	0	0	0	3	11
POR064	1	0	0	0	0	0	11	0	0	0	0	0	0	0
RUM065	143	60	0	15	15	4	19	1	0	1	15	2	2	6
SAU066	OR	OR	0	0	0	0	1	0	0	0	0	0	0	0
SPA067	0	0	0	0	0	0	12	0	0	1	0	0	2	0
SWD068	24	19	0	15	15	0	13	0	1	2	0	0	1	1
SWZ069	149	237	0	0	0	0	13	0	0	0	0	0	0	0
SYR070	2	2	0	0	0	1	13	0	0	2	0	0	1	0
TAI071	0	0	0	0	0	0	5	0	0	0	0	0	0	0
TUR072	0	0	0	0	0	0	11	0	0	0	0	0	0	0
UNS073	9	12	0	0	0	0	13	0	0	0	0	0	0	0
USR074	6430	7480	0	16	16	7	19	0	0	5	0	2	8	16
UNK075	325	222	0	11	11	0	13	0	0	6	0	0	2	1
USA076	2	10	0	0	0	0	13	0	0	0	0	0	0	0
URA077	0	0	0	0	0	0	13	0	1	1	0	0	0	1
VEN078	0	0	0	0	0	0	15	0	0	2	0	0	0	0
VTN079	11369	1338M	500E	11	11	4	12	0	1	4	0	0	1	4
VTS080	86	0	0	0	0	0	1	0	0	0	0	0	0	0
YEM081	OR	OR	0	0	0	0	0	0	0	0	0	0	0	0
YUG082	38556	44556	0	10	10	0	9	0	0	3	1	0	3	4

APPENDIX I-B (cont'd)

OBJECT NATIONS	15 CONCN	16 FOODN	17 RECON
AFG001	26	8	0
ALB002	114	33	0
APG003	10	0	0
AUL004	16	0	0
AUS005	32	0	0
BEL006	31	0	0
POL007	3	0	0
BRA008	2	0	0
BUL009	83	14	0
BUR010	162	31	0
CAM011	30	0	0
CAN012	7	0	2
CEY013	12	3	0
CHL014	10	0	0
CHT016	87	0	64
COL017	1	0	0
COS018	10	0	0
CUB019	0	0	0
CZE020	208	50	0
DEN021	11	0	0
DOM022	0	0	0
ECU023	0	0	0
EGP024	96	10	0
ELS025	1	0	0
ETH026	0	0	0
FIN027	54	17	0
FRN028	189	6	76
GME029	345	105	0
GMW030	103	12	41
GRC031	3	0	0
GUA032	6	0	0
HAI033	0	0	0
HON034	0	0	0
HUN035	102	5	0
IND036	425	56	3
INS037	259	46	2
IRN038	14	0	4
IRQ039	5	0	0
IRE040	5	0	0
ISR041	8	0	0
ITA042	79	3	0
JAP043	468	50	74
JOR044	6	0	0
KEN045	229	68	0
KOS046	55	0	33
LAO047	110	0	0
LEB048	18	0	0
LBR049	0	0	0
LBY050	0	0	0
MEX051	1	0	0
NEP052	23	9	0
NTH053	7	2	0
NEW054	7	0	0
NIC055	2	0	0
NOR056	10	4	0
OUT057	81	29	0
PAK058	51	3	3
PAN059	1	0	0
PAN060	0	0	0
PER061	0	0	0
PHI062	10	0	4
POL063	171	47	0
PCR064	1	0	6
RUM065	123	13	0
SAU066	20	0	0
SPN067	4	0	0
SWD068	23	1	0
SWZ069	24	0	0
SYR070	57	2	0
TAI071	12	0	11
TUR072	13	0	0
UNS073	0	0	10
USR074	1140	353	4
UNK075	217	0	84
USA076	296	17	941
URA077	2	2	0
VEN078	49	13	0
VTN079	394	138	9
WTS080	47	0	47
YEM081	1	2	0
YUG082	154	55	0

3) 1963 DATA

APPENDIX I-B (cont'd)

OBJECT NATIONS	1 EXPOR	2 IMPOR	3 ECAID	4 DIPPP	5 DIPTP	6 TREAT	7 CONSD	8 POPVT	9 POPVP	10 PROVT	11 ECOVT	12 ECOVP	13 CULVT	14 CULVP
AFG001	OR	OR	0	18	17	8	5	0	2	1	0	0	0	2
ALB002	453	137	410E	19	19	9	17	1	1	8	1	3	11	14
ANDO03	1	11	0	0	0	0	37	0	0	0	0	0	0	4
AUL004	136	2378	0	0	0	0	37	0	0	2	0	0	0	1
ALS005	31	11	0	0	0	0	44	0	0	0	0	0	0	0
BELO06	77	95	0	0	0	0	41	0	0	6	0	1	1	3
BCL007	OR	OR	0	0	0	0	19	0	0	2	0	0	0	3
BRAOO8	3	2	0	0	0	0	37	0	0	9	2	0	4	10
BULO09	34	37	0	23	23	4	36	0	0	2	0	2	0	3
BURO10	244	123	120	23	23	2	22	2	0	1	2	0	3	2
CAM011	92	15	53	15	15	4	8	1	1	2	1	1	1	6
CAN012	45	569	0	0	0	0	36	0	0	1	0	0	0	0
CEY013	273	211	50E	16	16	6	29	0	2	5	0	2	1	7
CHL014	0	0	0	0	0	0	33	0	0	5	0	0	1	2
CHT016	10	0	0	0	0	0	12	0	0	0	0	0	0	0
CCL017	1	0	0	0	0	0	33	0	1	1	0	0	0	0
COS018	OR	OR	0	0	0	0	17	0	0	0	0	0	0	0
CUB019	990S62	970S62	520	13	13	9	34	1	1	13	1	4	10	19
CZE020	307	241	0	23	23	2	46	0	0	1	0	0	3	0
DEN021	63	6	0	23	23	0	39	0	0	0	0	0	0	0
DOM022	OR	OR	0	0	0	0	12	0	0	0	0	0	0	0
ECU023	0	0	0	0	0	0	24	0	0	1	0	0	0	0
EGP024	187	164	6	17	17	4	29	1	1	1	1	0	2	2
ELS025	OR	OR	0	0	0	0	14	0	0	0	0	0	0	0
ETH026	0	0	0	0	0	0	10	0	0	0	0	0	0	1
FIN027	28	57	0	22	22	2	37	0	0	0	1	2	0	1
FRN028	198	594	0	0	0	0	51	0	0	1	0	2	0	3
GME029	247	104	0	23	23	3	26	1	0	3	0	2	1	4
GMA030	384	154	0	0	0	0	43	0	0	0	0	0	1	0
GRC031	1	0	0	0	0	0	29	0	0	0	0	0	0	1
GUA032	OR	OR	0	0	0	0	18	0	0	1	0	0	0	0
HAI033	0	0	0	0	0	0	13	0	0	0	0	0	0	0
HON034	OR	OR	0	0	0	0	15	0	0	0	0	0	0	0
HUN035	113	129	25	23	23	3	43	0	0	1	0	0	4	2
INO036	3	0	0	23	23	0	49	0	0	0	0	0	0	0
INS037	420S62	73	100	23	25	7	29	2	4	25	0	3	16	27
IRN038	0	0	0	0	0	0	28	0	0	0	0	0	0	0
IRQ039	113	45	0	15	13	0	22	0	0	0	0	0	0	1
IRE040	9	1	0	0	0	0	22	0	0	0	0	0	0	0
ISR041	0	0	0	5	5	0	35	0	0	0	0	0	0	0
ITA042	178	193	0	0	0	2	46	0	0	0	0	0	0	1
JAP043	701	624	0	0	0	17	48	0	0	45	3	16	9	44
JOR044	19	0	0	0	0	0	15	0	0	0	0	0	0	1
KEN045	819M	417M	263	23	23	8	26	1	1	14	3	10	17	31
KOS046	OR	OR	0	0	0	0	26	0	0	0	0	0	0	0
LAO047	45M	OMA	13E	11	11	2	8	0	3	1	0	0	0	1
LEB048	0	0	0	0	0	0	27	0	0	0	0	0	0	0
LBG049	CR	CR	0	0	0	0	9	0	0	0	0	0	0	0
LBY050	3	0	0	0	0	0	12	0	0	0	0	0	0	0

APPENDIX I-B (cont'd)

OBJECT NATIONS	1 EXPOR	2 IMPOR	3 EGAID	4 DIPFP	5 DIPTP	6 TREAT	7 CONGO	8 POPVT	9 POPVP	10 PROVT	11 ECOVT	12 ECOVP	13 CULVT	14 CULVP
PEN051	0	0	0	0	0	1	35	0	0	2	0	1	1	3
NEP052	38M	0MA	25	18	17	2	10	0	1	3	0	0	1	1
NTH053	149	129	0	18	19	1	42	0	0	0	2	1	1	0
NEW054	19	49	0	0	0	1	26	0	0	5	0	0	0	3
NIC055	0R	0R	0	0	0	0	14	0	0	0	0	1	0	0
NOR056	14	33	0	18	18	1	32	0	0	0	0	0	0	4
CUT057	120M	92M	100	23	23	2	21	0	0	2	1	2	2	6
PAN058	55	129	0	0	0	12	28	0	2	4	2	4	5	0
PAN059	0R	0R	0	0	0	0	20	0	0	0	0	0	0	0
PAP060	0R	0R	0	22	22	0	18	0	0	2	0	0	0	0
PER061	0	0	0	0	0	0	29	0	0	1	0	0	0	4
PHI062	0	0	0	0	0	0	24	0	0	0	0	0	0	2
POL063	243	112	0	23	23	3	44	0	0	2	0	1	6	6
POR064	2	2	0	0	0	0	33	0	0	0	0	0	0	4
RUM065	141	139	0	23	23	8	39	0	0	2	1	2	6	1
SAU066	0P	0R	0	0	0	0	7	0	0	0	0	0	0	0
SPA067	14	0	0	0	0	0	36	0	0	0	0	1	0	4
SWD068	72	47	0	23	23	0	38	1	0	0	0	0	0	0
SWZ069	98	39	0	0	0	0	42	0	0	0	1	0	0	2
SYR070	28	199	82E	17	17	3	17	0	0	0	0	1	0	1
TAI071	0	4	0	0	0	0	18	0	0	0	0	0	0	0
TUR072	0	0	0	0	0	0	28	0	0	0	0	0	0	0
UNS073	24	60	0	0	0	0	33	0	0	2	0	0	6	1
USR074	4120	1820	0	24	24	7	45	1	0	8	2	0	10	5
UNK075	4R9	374	0	19	19	2	44	0	0	1	1	4	1	2
USA076	48	969	0	0	0	0	44	0	0	1	0	0	0	0
URU077	0	1	0	0	0	0	26	0	0	0	1	0	0	5
VEN078	2	0	0	0	0	0	33	0	0	3	0	0	0	0
VTN079	406M	189M	225	19	19	7	17	2	1	10	1	5	8	19
YTS080	0	0	0	0	0	0	27	0	0	3	0	0	0	1
YEM081	0R	0R	27	17	5	0	3	1	0	0	0	0	0	0
YUG082	1	0	0	18	18	1	31	0	0	0	0	0	0	0

APPENDIX I-B (cont'd)

OBJECT NATIONS	15 COERCE	16 FOCON	17 RECON
AFG001	54	65	0
ALB002	328	94	0
ARG003	31	0	0
AUL004	19	0	0
AUS005	6	0	0
BEL006	23	0	0
BOL007	4	0	0
BRA004	65	0	0
BUL009	47	6	2
BUR010	124	32	0
CAM011	256	101	0
CAN012	26	4	1
CEY013	140	63	0
CHL014	34	0	0
CHT016	52	1	81
COL017	13	0	0
COS018	13	0	0
CUB019	518	158	0
CZE020	65	4	71
DEN021	13	4	0
DOM022	3	0	0
ECU023	31	0	0
EGP024	90	22	0
ELS025	5	0	0
ETH026	9	0	0
FIN027	21	0	0
FRN028	145	0	4
GME029	46	20	12
GMA030	55	0	6
GRC031	3	0	0
GUA032	10	0	0
HAI033	3	0	0
HON034	0	0	0
HUN035	52	6	0
IND036	373	66	583
INS037	544	123	3
IRQ038	0	0	0
IRN039	31	4	42
IRE040	0	0	0
ISR041	1	0	0
ITA042	27	0	0
JAP043	692	41	14
JOR044	0	0	0
KOR045	750	447	0
KOS046	36	0	0
LAO047	391	74	2
LEB048	1	0	0
LBR049	0	0	0
LBY050	0	0	0

OBJECT NATIONS	15 COERCE	16 FOCON	17 RECON
MEX051	37	0	0
NEP052	93	35	1
NTH053	10	0	0
NEW054	75	0	0
NIC055	6	0	0
NOR056	9	2	0
OUT057	58	35	0
PAK058	227	67	0
PAN059	3	0	0
PAR060	3	0	0
PER061	16	0	0
PHI062	3	0	0
POL063	52	4	0
POR064	1	0	0
RUM065	66	0	0
SAU066	2	0	0
SPN067	3	0	0
SWD068	20	0	0
SWZ069	8	0	0
SYR070	32	6	0
TAI071	8	0	1
TUR072	6	0	0
UNS073	5	0	4
USR074	142	86	265
UNK075	160	0	22
USA076	645	6	735
URA077	12	0	0
VEN078	46	0	17
VTN079	587	232	0
YIS080	183	0	46
YEM081	16	6	0
YUG082	49	25	62

APPENDIX II-A

COMPARISON OF A-SPACE ROTATED FACTOR LOADINGS: ORIGINAL, TRANSFORMED, REDUCED, AND REDUCED AND TRANSFORMED DATA, 1955 AND 1963

EXPLANATIONS

O: Original Data Set (N = 82)

T: Transformed Data Set (N = 82)

R: Reduced Data Set (N = 56)

RT: Reduced and Transformed (N = 56)

Factor technique employed: Component Analysis Rotation
Criterion: Varimax

In the tables, only the loadings that exceed .30 are given.

APPENDIX II-A

(CONTINUED)

FACTOR LABELS		I POWER								II FORIE								III DEVEL							
YEAR		1955				1963				1955				1963				1955				1963			
KIND OF DATA		O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT
FACTOR ORDER		1	1	2	2	1	1	2	2	2	2	3	3	2	2	3	3	3	3	1	1	3	3	1	1
1	POPUL		67		64		73		71																
2	AREAT		62		60	-64	70	63	66																
3	DENST																								
4	ARLVD																								
5	EXPPO	-97	91	98	91	-97	92	97	91																
6	STPPO	-96	90	96	89	-94	91	95	89																
7	GXPTL	-98	95	98	95	-95	94	95	92																
8	LITPC																	-71	-74	-79	-78	-51	-84	55	-66
9	EDUCN	-51		53														-73	-81	-71	-81	-78	-75	75	-80
10	TELPH																	-86	-91	-82	-90	-90	-77	87	-90
11	PHYSI																						81		60
12	GXPPC																	-80	-80	-77	-78	-87	-70	-83	-81
13	HATPO																	-79	-84	-82	-86	-76	-93	76	-83
14	GEOGS																								
15	FORIE	-62	84	67	84	-82	84	83	87																
16	COUPL	-97	93	97	93	-87	91	87	92																
17	DEFEX	-98	94	98	95	-94	93	94	94																
18	BLOCN									-85	-86	-85	87	89	87	-85	89								
19	COUGT									78	80	88	-89	-83	-94	91	-87								
20	KILLD																								
21	KILLS																								
22	USAID																								
23	USAID													-57	-74		-60								
24	UNVOT									-82	-84	-71	-70	75	74	-64	70								
25	COLON																								
26	CATHL																	-54		-51	-50				
27	PROTS																								
28	MUSLM																	-84	-79	-36	-85	-78		84	-83
29	BUDDH																			55					
30	LATIN																								
31	GEISS																								
32	GOVPO											-74	78	63	58	-68	70								
33	WTRAD	-60	55	62	51	-61	64	61	56				50										-52		
34	CTRAD						54		50					-58	-69	60	-70	-54	-64			-56	-50		-52
35	ITRAD									-77	-74	-68		91	93	-90	92		-53						

(CONTINUED)

APPENDIX II-A

(CONTINUED)

FACTOR LABELS		IV WESTC								V URAID								VI AGRIC							
YEAR		1955				1963				1953				1963				1955				1963			
KIND OF DATA		O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT
FACTOR ORDER		4	5	7	6	4	6	5	6	5	13	6	8	14	13	14	10	6	4	4	4	6	4	4	4
1	POPUL									83		84													
2	AREAT																		-55		-59		-56		-60
3	DENSC																	86	91	83	91	91	89	-89	91
4	APLND																	79	82	82	82	66	80	-71	79
5	EXPPO																								
6	STPPO																								
7	GVPCL																								
8	LIVPC																								
9	ENCON																								
10	TELPH																								
11	PHYSI																								
12	GVPPC																								
13	MAJPO																								
14	GEOGS	(49)	-51	-61	-61	-66	-66	-72	-72																
15	FORTS									54		56													
16	COMPL																								
17	DEFEX																								
18	BLOCK																								
19	COMST																								
20	MILDS																								
21	MILLP																								
22	USAID									90	84	90	84	-60	-51	-80	-67								
23	URAID																								
24	UNVOT																								
25	COLON																								
26	CATTL	74	-74	-90	-92	65	-59	-92	-90																
27	PEOCC																								
28	HOUSN	-83	83																						
29	EDUCN					-85	89																		
30	LAUDI																								
31	CHINS					-53	54																		
32	GOPPO																								
33	MTRAD																								
34	CTRAD																								
35	ITRAD																								

(CONTINUED)

APPENDIX II-A

(CONTINUED)

FACTOR LABELS	VII ORIEN								VIII DIVER								IX WELFA							
YEAR	1955				1963				1955				1963				1955				1963			
KIND OF DATA	O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT
FACTOR ORDER	7	6	5	5	10	5	10	5	8	9	11	10	12	9	9	7	9	10	9	9	5	14	11	13
1 POPUL																								
2 AREAT																								
3 DENST																								
4 ARLND																								
5 EXPPO																								
6 STPRO																								
7 GRPCL																								
8 LITRC																					-66		-64	
9 EXCOM																								
10 TELPH																								
11 PHYSI																	92	87	-96	89	90		88	63
12 GRPPC																								
13 MAGPO																								
14 GRODS	-50	-54																						
15 FORCE																								
16 COMPL																								
17 DEFEX																								
18 BLOCM																								
19 COMST																								
20 KILLP																								
21 KILLT																								
22 USAID																								
23 UNAID																								
24 UNVOT																								
25 COLON																								
26 CATHL					-53	53																		
27 PROTS																								
28 MOSLM			-60	-75	92	-91	79	82																
29 BUDDH	75	81	79	75			-69	-65																
30 LANGH									-90	90	-94	-91	94	-96	-95	-93								
31 CHIEX	86	81	73				-57	-61																
32 GOPPO																								
33 NTRAD																								
34 CTRAD																								
35 ITRAD																								

(CONTINUED)

APPENDIX II-A

(CONTINUED)

FACTOR LABELS		X POSTA								XI CTRAD								XII COLON							
YEAR		1955				1963				1955				1963				1955				1963			
KIND OF DATA		O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT
FACTOR ORDER		10	7	10	13	11	10	7	9	11	11	13	11	9	11	13	14	12	12	12	12	13	12	12	11
1	POPUL																50								
2	AREAT													55		50									
3	DENST																								
4	ARLND																								
5	ENTRO																								
6	STPPO																								
7	GNPCL																								
8	LITRC																								
9	ENTCM																								
10	TELPH																								
11	PHYST																								
12	GNPPC																								
13	WASPC																								
14	SELTS																								
15	PCPTE																								
16	IDIPL																								
17	DEFEX																								
18	BLOOM																								
19	CHIDT																								
20	MILLD	96	94	-95	93	94	-95	-94	94																
21	MILLF																								
22	URAID																								
23	LRAID																								
24	DPOPT																								
25	CTLAN																			-62	71	76	-79	69	-73
26	CATHL																								
27	PRTCS														87										
28	MCDIA																								
29	BIOCH																								
30	LANDA																								
31	CHINS																								
32	LOFPO																	80	-82						
33	MTRAD																								
34	CTRAD									69	(-48)	-76	61	59		58									
35	ITRAD										(49)	(40)	-53												

(CONTINUED)

APPENDIX II-A

(CONTINUED)

FACTOR LABELS		XIII FCONF								XIV USAID							
YEAR		1955				1963				1955				1963			
KIND OF DATA		O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT
FACTOR ORDER		13	8	8	7	8	8	6	8	14	14	14	14	7	7	8	12
1	POPUL					-59		56						57		60	
2	AREAT																
3	DENST																
4	ARLND																
5	EXPRO																
6	STPRO																
7	GNPTL																
8	LITRC																
9	EXCON																
10	TELPH																
11	PHYSI																
12	GNPPC																
13	EAGPO																
14	GEOPS																
15	FORCE																
16	COMPL																
17	DEFEX																
18	BLOOM																
19	COMST																
20	KILLD																
21	KILLF	92	91	-94	-94	92	91	-94	-94								
22	USAID									76		-84		84	-84	82	-76
23	URAID																
24	UNVOT																
25	COLON										59						
26	CATHL																
27	PROTS																
28	MOSLM																
29	BUDDH																
30	LANGN																
31	CHINS					-54	-51						-76				
32	GOPPO																
33	WTRAD																
34	CTRAD																
35	ITRAD																

APPENDIX II-B

COMPARISON OF B-SPACE ROTATED FACTOR LOADINGS: ORIGINAL, TRANSFORMED, REDUCED, AND REDUCED AND TRANSFORMED DATA, 1955 AND 1963

EXPLANATIONS

O: Original Data Set (N = 81)

T: Transformed Data Set (N = 81)

R: Reduced Data Set (N = 55)

RT: Reduced and Transformed (N = 55)

Factor technique employed: Component Analysis Rotation
Criterion: Varimax

In the tables, only the loadings that exceed .30 are given.

APPENDIX II-B

(CONTINUED)

FACTOR LABELS		I TRADE								II FDIPL								III INDIP							
YEAR		1955				1963				1955				1963				1955				1963			
KIND OF DATA		O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT	O	T	R	RT
FACTOR ORDER[a]		1	1	1	7	2	4	3	5	2	6	2	1	3	2	2	2	3	2	3	2	1	1	1	1
1	EXPOR	97	89	96	-88	-86	72	-86	-74																
2	IMPOR	93	92	97	-91	-83	88	-84	-91																
3	BOAID																								
4	DIFFP									90	-87	92	89	-96	95	97	96								
5	DIFFP									90	-86	92	88	-96	95	97	97								
6	TREAT	52	71		-50																	79	76	81	79
7	COMTO																								
8	POPUP											51													
9	POPUP																	-75	76	63	-60				
10	POPUP																	-86	82	85	-83				
11	EDUCP																	-66	63	72	-73				
12	EDUCP																	-83	80	86	-86				
13	GOVTO	67	76	69	-79																				
14	GOVTP	54	53	50	-69																				
15	COMOT	83	73	84	-75																				
16	FOODT	92	80	92	-80																				
17	MECOM																								

[a]The order appeared in original computer outputs.

(CONTINUED)

APPENDIX II-B

(CONTINUED)

FACTOR LABELS	IV ECAID								V NECOM							
YEAR	1955				1963				1955				1963			
KIND OF DATA / FACTOR ORDER	O 4	T 3	R 4	RT 4	O 4	T 5	R 6	RT 7	O 5	T 5	R 5	RT 5	O 5	T 3	R 5	RT 4
1 EXPOR																
2 IMPOR																
3 ECAID	96	-92	-96	93	88	-74	-86	-75								
4 DIFFP																
5 DIFTP																
6 TREAT																
7 CONGO																
8 POFVT					64	-35	-68	-84								
9 POFVF																
10 PNOVT																
11 ECOVT																
12 ECOVF																
13 CULVT					56	-51	-57									
14 CULVF																
15 CONCN																
16 POCOM					65		-65	-51								
17 NECOM									-99	97	99	-98	95	-96	95	-96

(CONTINUED)

APPENDIX II-B

(CONTINUED)

FACTOR LABELS	VI CONGO								VII VISIT							
YEAR	1955				1963				1955				1963			
KIND OF DATA / FACTOR ORDER	O 6	T 7	R 6	RT 6	O 7	T 7	R 7	RT 3	O 7	T 4	R 7	RT 3	O 6	T 6	R 4	RT 6
1 EXPOR																
2 IMPOR																
3 ECAID																
4 DIPFP																
5 DIPTP																
6 TREAT																
7 CONGO	-89	90	-85	83	-88	-73	86	-75								
8 POPVT									84	86	67	-69				
9 POPVF											65	-67	86	90	80	-87
10 PNOVT																
11 ECOVT																
12 ECOVF																
13 CULVT																
14 CULVF			-54													
15 CONCN																
16 POCOM																
17 NECOM																

APPENDIX III-A

FACTOR SCORES OF FOURTEEN ROTATED ATTRIBUTE SPACE BASIS DIMENSIONS, 1955 AND 1963

1) EXPLANATIONS

Kind of raw data: Original Data Set (N = 82)

Number of variables in raw data set: 35

Factor technique employed: Component Analysis

Rotation criterion: Varimax

APPENDIX III-A (cont'd)

2) 1955 DATA

NATIONS	I POWER	II FORIE	III DEVEL	IV WESTC	V UNAID	VI AGRIC	VII ORIGN	VIII DIVER	IX WELFA	X POSTA	XI CTRAD	XII COLON
AFG001	0.015537	0.119303	0.451507	-2.210452	-0.274223	-0.176419	-0.524465	-0.324123	0.15[illegible]	-0.175575	0.227578	[illegible]
ALB002	0.055006	1.500134	0.735929	-1.235751	-0.302272	-0.211429	-0.057004	0.356244	[illegible]	-0.217445	[illegible]	[illegible]
ARG003	0.246170	-0.375510	-0.146573	1.144004	-0.126227	-1.470434	-0.116036	0.567554	-0.177[illegible]	2.765417	-1.702747	[illegible]
AUL004	0.449528	-0.559008	-0.442965	-0.074720	0.152071	-1.464133	1.252274	-0.045[illegible]	[illegible]	0.147370	[illegible]	[illegible]
AUS005	0.144935	0.014394	-0.166679	0.648061	-0.216283	0.424127	-0.401205	0.164716	-0.744523	-0.520115	[illegible]	1.776417
BEL006	0.116150	-0.052037	-0.913117	0.595047	-0.115316	2.366784	-0.039374	0.612159	[illegible]	[illegible]	-1.1[illegible]	[illegible]
BOL007	0.119459	-0.718444	0.763675	1.141220	-0.155114	-0.544444	-0.847147	-0.357717	[illegible]	-0.117[illegible]	0.241514	[illegible]
BRA008	0.055774	-0.423316	0.594100	1.282945	0.373353	-1.572232	-0.622119	-0.237217	-0.1[illegible]	[illegible]	-1.1[illegible]	[illegible]
BUL009	0.134478	1.565201	0.049363	-0.177128	0.163550	0.377651	-0.461752	0.021643	-0.367952	-0.315541	1.126618	-1.121412
BUR010	0.174676	1.044455	0.025125	-0.075307	-0.206021	-0.665075	2.161275	0.495723	0.192254	-0.227447	0.127623	1.5[illegible]
CAM011	0.143574	0.592950	0.503152	0.002166	-0.357370	-0.405543	2.546064	0.006936	0.773539	-0.730[illegible]	0.633110	1.3[illegible]
CAN012	0.058234	-0.888416	-2.681122	0.030331	-0.344385	-1.065145	1.580847	-1.597055	-0.549394	0.544602	-0.165105	[illegible]
CEY013	0.193278	0.500091	0.358104	-0.043601	-0.082568	0.465590	0.633743	0.815553	0.143310	-0.355637	0.494521	1.4[illegible]
CHL014	0.165004	-0.527591	0.272522	1.286602	-0.076505	-0.520652	-0.778254	0.560444	-0.317267	0.135564	0.137554	[illegible]
CHN015	-0.026465	0.173822	0.504665	-0.267048	7.981595	-0.443439	1.543450	0.411529	-0.034605	0.338153	0.131265	-0.712244
CHT016	0.169305	-1.032734	0.496381	-0.199036	-0.496930	1.943682	2.522117	-0.606457	-0.522174	-0.240556	0.407127	[illegible]
COL017	0.112254	-0.756921	0.336160	0.450031	-0.162017	-0.540424	-0.331315	0.606635	-0.169517	0.142265	0.117624	-1.447[illegible]
COS018	0.274656	-0.552753	0.337955	1.112356	-0.050030	-0.627277	-0.055556	0.260413	-0.440435	-0.739217	0.257636	[illegible]
CUB019	0.243712	-0.756545	0.119472	0.916557	-0.190353	-0.274441	0.674421	0.301713	-0.307466	[illegible]	-0.137773	[illegible]
CZE020	-0.157353	2.455300	-0.273614	1.134421	-0.755746	1.577245	-0.416260	-0.061497	-1.435744	-0.141[illegible]	0.713075	-0.459519
DEN021	0.611730	0.342978	-2.625453	-0.565278	0.321381	0.640777	-0.677164	0.767576	0.322297	-0.211557	1.604575	0.577651
DOM022	0.196573	-0.363050	0.510031	0.939635	-0.160746	-0.174050	0.000569	0.122594	-0.113481	-0.131712	0.199564	-0.727548
ECU023	0.175615	-0.018226	0.545434	1.098914	-0.068820	-0.794147	-0.675918	0.354643	-0.151555	-0.149772	0.104222	0.546275
EGP024	0.100545	0.160965	0.660378	-1.942052	-0.133446	-0.702249	-0.844739	0.573933	-0.407326	-0.232035	-1.156422	-0.272540
ELS025	0.058503	-0.674727	0.751191	0.442584	0.059755	0.420473	-0.796557	0.335030	0.174628	[illegible]	0.320336	[illegible]
ETH026	0.422785	-0.257006	-0.115324	-0.356964	-0.507900	-0.374179	-0.293859	-2.705995	2.219415	-0.495066	0.676950	-1.127318
FIN027	0.763004	1.005250	-1.708684	-0.619384	-0.038403	-1.137537	-0.552532	0.155477	0.229542	-0.412739	-1.413217	1.159524
FRA028	-0.452785	-0.451130	-0.453445	0.094112	0.219339	0.476035	-0.631759	1.504238	0.761483	-0.175152	-1.322795	0.353771
GME029	0.356191	1.603043	-1.592755	0.147751	-0.263901	1.320751	-0.763559	0.106142	-0.016095	[illegible]	0.520793	-2.144419
GMW030	-0.290365	-0.023162	-1.136143	-0.267625	0.138020	1.341565	-0.437228	0.585096	0.361431	-0.252829	-2.575437	0.309720
GRC031	0.172361	-0.243722	0.115069	0.007253	-0.090012	0.240365	-0.374243	0.436053	-0.171314	-0.282595	0.257368	0.561235
GUA032	0.137303	-0.085177	0.656126	0.500145	-0.164255	-0.290542	-0.054427	0.166127	0.214595	-0.117217	0.316414	-0.716419
HAI033	0.058533	-0.847841	1.194652	0.702481	-0.040445	0.215566	-0.035967	0.231340	0.357354	-0.442473	0.257101	0.460545
HON034	0.127057	-0.572324	0.745523	0.795516	-0.144504	-0.530533	-0.056736	0.233740	0.064411	-0.149675	0.300706	-0.714400
HUN035	0.185560	1.506021	-0.467073	0.947000	-0.150613	1.141738	-0.602535	0.366416	0.075105	7.446547	0.640026	-0.741035
IND036	-0.073417	0.220005	0.723137	-0.246033	1.016015	1.560773	-0.692940	-3.256530	0.254279	1.446396	0.160515	2.277552
INS037	0.112275	-0.140785	0.680671	-2.087950	0.241381	-0.214479	1.140011	-0.017626	0.200307	2.714534	-0.500[illegible]	[illegible]
IRN038	0.034434	-0.454744	0.499604	-1.513402	-0.366363	-0.172450	-0.075446	-1.473621	-0.455755	-0.767242	-0.142124	-1.762165
IRQ039	0.026659	-0.425499	0.052026	-2.067456	-0.171592	-0.346737	-0.550217	0.365524	-0.191347	-0.475712	-0.316729	-0.532257
IRE040	0.035478	0.177259	0.157272	0.702211	-0.196127	0.124055	-0.341024	0.016058	-0.569787	-0.229411	0.523452	1.224759
ISR041	0.256754	0.573371	-0.252041	-0.128637	-0.273818	0.268582	-0.249557	0.156647	-0.753094	-0.360758	0.592682	1.563437
ITA042	-0.126671	-0.273532	0.196098	0.564323	0.126732	1.796799	-0.921454	0.687453	-0.074529	-0.262172	-1.095421	0.737711
JAP043	0.191483	-0.945058	-0.337376	-0.984933	0.337470	1.311550	1.921325	1.118756	-0.135707	-0.462744	-0.937004	-0.495[illegible]
JOR044	0.051437	-0.467052	0.957103	-1.869145	-0.327443	-0.404455	-0.548174	0.005401	-0.570924	0.717400	-0.126665	0.499167
KON045	0.055356	3.769552	0.626377	0.446912	-1.200610	-0.126995	1.776982	0.156622	-1.052775	-0.372534	-2.532183	-1.322[illegible]
KOS046	-0.016009	-3.055120	0.825500	-0.237262	-0.405753	1.510164	1.604303	0.076475	-0.983915	-0.154315	0.412474	0.565533
LAO047	0.103552	0.932774	0.654267	-0.050814	-0.355907	-0.725447	1.765157	0.002207	0.574185	-0.256673	0.460423	1.719255
LEB048	0.122476	0.032355	0.726263	-0.350847	-0.485664	1.229291	-0.554262	-1.682027	-0.504013	-0.385585	0.100518	1.345504
LBR049	0.297557	-0.157649	0.147425	-0.132603	-0.178782	-0.586372	-0.052514	-0.857741	0.933772	-0.566605	0.562242	0.462467
LBY050	0.029467	-0.217512	0.941897	-1.560128	-0.132995	-1.012467	-0.675312	0.380973	-0.462673	0.251715	-0.125624	1.123355

APPENDIX III-A (cont'd)

NATIONS	I POWER	II FORIE	III DEVEL	IV WESTC	V URAID	VI AGRIC	VII CRIGN	VIII DIVER	IX WELFA	X POSTA	XI CTRAD	XII COLON
MEX351	0.125416	-0.627754	0.471533	0.326216	0.056065	-0.456669	0.257317	-0.045249	-0.177718	[illegible]	-0.172526	[illegible]
NEP352	-0.059071	0.362765	0.613143	0.555119	-0.317363	0.489350	0.140413	0.344933	7.795144	0.212491	-0.517774	0.141173
NTH353	0.452129	-0.626518	-1.246659	-0.278920	0.105642	1.654420	0.330367	0.504062	0.124[illegible]	-0.711135	-1.[illegible]	-0.[illegible]
NEW354	0.686733	-0.317154	-2.536749	-0.374552	-0.035929	-1.232767	0.061553	0.376026	0.207541	-0.[illegible]	1.[illegible]	-0.[illegible]
NIC355	0.[illegible]	-0.656722	0.475074	0.[illegible]	-0.172121	-0.[illegible]	-0.695039	0.035297	0.271[illegible]	-0.[illegible]	[illegible]	[illegible]
NIR356	0.637727	0.579531	-2.394764	-0.707336	0.758226	-1.294683	-0.242624	0.571535	0.127[illegible]	-0.[illegible]	1.[illegible]	1.[illegible]
NOR357	[illegible]	1.203495	0.412715	0.347357	-0.[illegible]	-1.[illegible]11	1.281778	1.787216	0.227771	-0.[illegible]	-1.[illegible]	-0.[illegible]217
PAK358	-0.[illegible]135	-0.551[illegible]	1.077684	-1.731744	-0.[illegible]	0.735544	-0.593592	-1.106671	-0.[illegible]	0.[illegible]	-0.[illegible]	1.[illegible]
PAN359	0.257706	-0.[illegible]	0.205970	1.[illegible]	-0.124661	-0.[illegible]	0.200592	0.176671	-0.[illegible]14	0.71[illegible]11	0.[illegible]	0.[illegible]
PAR360	0.155216	-0.701591	0.494154	1.1[illegible]	-0.221644	-1.[illegible]	-0.[illegible]	0.403[illegible]	-0.[illegible]	-0.14[illegible]	0.[illegible]	-1.[illegible]
PER361	0.[illegible]	-0.711[illegible]7	0.724927	1.1[illegible]	-0.1[illegible]	-0.[illegible]	-0.776[illegible]	-3.[illegible]	-0.[illegible]252	[illegible]	[illegible]	[illegible]
PHI362	0.214[illegible]	-0.[illegible]41	0.5[illegible]	0.[illegible]	-0.347952	0.[illegible]	1.173674	-2.345[illegible]	-0.[illegible]	-0.[illegible]	[illegible]	[illegible]
POL363	0.[illegible]	1.6[illegible]	0.[illegible]	[illegible]	0.4[illegible]	1.[illegible]	-1.427[illegible]	0.713[illegible]	-0.[illegible]	-0.[illegible]	0.1[illegible]	0.[illegible]731
POR364	0.1[illegible]	-0.474[illegible]3	0.[illegible]	0.[illegible]	0.141[illegible]	0.[illegible]	-0.[illegible]	1.052[illegible]	0.[illegible]	-0.[illegible]	0.[illegible]	-1.7[illegible]
RUM365	0.677115	1.[illegible]	0.[illegible]	0.1[illegible]	0.417[illegible]	0.734373	-0.[illegible]374	0.2[illegible]	0.[illegible]47	-0.[illegible]	0.[illegible]	-0.7[illegible]
SAU366	-0.[illegible]	-0.[illegible]	0.[illegible]33	-2.4[illegible]	0.[illegible]134	-0.[illegible]	-0.563007	0.444776	-0.197344	-0.[illegible]	0.245712	-1.[illegible]
SPN367	-0.[illegible]	-0.[illegible]27	0.[illegible]	0.[illegible]	0.[illegible]	0.[illegible]	-0.737[illegible]	0.292435	0.[illegible]	-0.1[illegible]	0.[illegible]	-0.[illegible]
SWD368	0.51[illegible]7	0.744[illegible]	-2.354127	-1.777453	0.127618	-1.[illegible]	-0.305207	0.541041	0.11[illegible]77	-0.[illegible]	1.[illegible]	1.[illegible]
SWZ369	0.510659	0.27[illegible]7	-1.3[illegible]41	-0.1[illegible]1	-0.114216	-0.0[illegible]47	-0.269105	-0.427419	-0.1[illegible]	-0.[illegible]	0.7[illegible]281	1.[illegible]
SYR370	0.114377	0.16[illegible]	0.[illegible]1	-1.[illegible]	-0.[illegible]	0.019549	-0.592465	0.003723	-0.1[illegible]	-0.[illegible]	0.455[illegible]	[illegible]
TAI371	0.213742	-0.[illegible]1717	0.[illegible]	-0.1[illegible]	-0.[illegible]	-0.774027	2.941[illegible]	0.[illegible]	0.7[illegible]	-0.[illegible]	0.[illegible]24	-1.[illegible]
TUR372	-0.[illegible]	-0.[illegible]	0.743773	-1.7[illegible]4	-0.[illegible]1161	-0.[illegible]512	-1.073553	0.433[illegible]	-0.[illegible]	[illegible]	-1.[illegible]	[illegible]
UNS373	0.[illegible]	-1.[illegible]	-1.[illegible]47	0.[illegible]	-0.[illegible]	-0.4[illegible]	0.374[illegible]	-2.[illegible]	0.41[illegible]1	-0.1[illegible]	0.[illegible]	-0.[illegible]
USR374	-0.[illegible]	1.812[illegible]	-0.[illegible]	1.[illegible]	1.1[illegible]	-2.1[illegible]	-0.023753	-3.915[illegible]	-2.[illegible]	-0.[illegible]771	-2.[illegible]	-1.[illegible]
UKG375	-0.[illegible]	-1.[illegible]	-1.[illegible]7	-0.[illegible]7	0.[illegible]123	1.79[illegible]	0.3[illegible]704	0.5[illegible]4301	0.317[illegible]	-0.[illegible]	-[illegible]	[illegible]
USA376	-0.[illegible]	-0.[illegible]	-0.[illegible]	-0.[illegible]	-0.6[illegible]	0.[illegible]7005	0.309440	1.265210	0.155357	0.[illegible]	1.[illegible]7	0.[illegible]
URA377	0.225[illegible]	-0.355[illegible]	-0.[illegible]	1.2[illegible]71	-0.145[illegible]	-0.[illegible]531	-0.757693	0.651[illegible]	-0.3[illegible]	0.[illegible]	0.[illegible]65	0.[illegible]
VEN378	-0.121792	-0.652[illegible]	0.[illegible]	0.[illegible]	-0.212786	-0.71[illegible]	-0.412347	0.426[illegible]	-0.[illegible]	-0.[illegible]	0.[illegible]	0.[illegible]
VTN379	0.072444	0.7[illegible]7	0.[illegible]57	-0.[illegible]1	-0.525[illegible]	0.416780	1.502261	0.457253	-0.372[illegible]	-0.[illegible]7	0.735[illegible]	0.2[illegible]
VTS380	0.436[illegible]4	-0.5[illegible]	0.[illegible]	0.14[illegible]	-0.420[illegible]	0.252273	2.159112	-0.156171	0.133[illegible]	-0.[illegible]	0.611436	-0.[illegible]
YEM381	0.537565	-0.1[illegible]	0.7[illegible]	-3.[illegible]	-0.059242	-0.236664	-0.603394	0.924094	1.127[illegible]1	-0.1[illegible]	0.1[illegible]	-1.4[illegible]
YUG382	-0.[illegible]	1.010994	0.[illegible]	0.252214	-0.337600	0.705716	-0.783553	-1.143593	-0.426[illegible]	-0.1[illegible]	0.[illegible]31	-0.[illegible]

APPENDIX III-A (cont'd)

NATIONS	XIII POOMF	XIV USAID
AFG001	-0.270432	-1.099242
ALB002	-0.422179	-0.904527
ARG003	-0.525905	0.218215
AUL004	-0.294316	-0.118231
AUS005	-0.448714	-0.878587
BEL006	-0.209878	-1.343651
BCL007	0.037591	0.151530
BRA008	-0.172283	0.695505
BUL009	-0.251082	-0.418175
BUR010	-0.267291	0.082907
CAM011	-0.220942	0.215151
CAN012	-1.357015	-1.761661
CEY013	0.221257	0.373552
CHL014	-0.061551	-0.145215
CHN015	-0.028302	-0.472658
CHT016	0.255563	0.603823
CCL017	-0.059348	-0.352245
CCS018	-0.070473	-0.387230
CUB019	-0.265455	-0.637776
CZE020	-1.270594	-1.762555
DEN021	0.345080	1.408042
DOM022	0.023619	-0.680020
ECU023	0.074255	-0.270260
EGP024	0.068572	0.626331
ELS025	0.244584	-0.313740
ETH026	0.199128	-0.691661
FIN027	0.152971	0.622117
FRN028	0.7nnnn3	-0.103382
GPE029	-0.120371	0.134211
GMB030	0.122391	-0.371452
GRC031	-0.072670	1.240n29
GUA032	0.029561	-0.437223
HAI033	0.224397	-0.377527
HCN034	0.051607	-0.571172
HUN035	1.n30385	0.285496
INDC36	-0.437070	1.1n1251
INS037	-0.596344	-1.379476
IRN038	-0.570667	1.367316
IRQ039	-0.100305	-0.547644
IRE040	-0.268219	-0.685339
ISR041	2.935255	-0.510194
ITA042	-0.262274	1.585744
JAP043	0.074538	0.880591
JOR044	-0.022634	-0.752012
KON045	-1.784227	-0.794e30
KOS046	-0.255431	4.270041
LAO047	-0.101941	0.532155
LEB048	-0.347106	-1.317711
LBR049	0.385753	0.361728
LBY050	-0.190252	-0.479148

NATIONS	XIII POOMF	XIV USAID
MEX051	-0.184795	-0.738995
NFP052	-0.545561	-0.391ee3
NTH053	0.300833	-0.569124
NEW054	-0.043848	0.339ee4
NIC055	0.115426	-0.270c5e
NOR056	0.142555	0.618554
OUT057	-0.564445	1.231753
PAK058	-0.502e05	0.6e1721
PAN059	-0.095554	-0.550404
PAR060	0.002777	-0.135183
PER061	-0.133528	1.407411
PHI062	-0.562715	-1.11e592
POL063	-0.667325	-1.352681
POR064	0.233930	1.0e2833
RUM065	-0.231370	-0.664586
SAU066	0.162216	-0.665957
SPN067	-0.130551e	2.2095e8
SWD068	0.035059	0.415946
SWZ069	-0.050e0e	-0.2e4e91
SYR070	0.024e91	0.287d0e
TAI071	-0.121316	0.471210
TUR072	-0.498710	1.747596
UNS073	-0.195654	-0.15e23E
USR074	3.030078	1.451.94
UNK075	0.5ded51	-0.662e59
USA076	-1.009465	-0.357027
URA077	-0.172069	-0.109212
VEN078	-0.24e112	-0.458e52
VTN079	7.14e644	-1.30ee57
VTS080	-0.31e078	-0.093014
YEM081	0.037501	-0.677e75
YUG082	-0.519392	2.201495

3) 1963 DATA

APPENDIX III-A (cont'd)

NATIONS	I POWER	II FORIE	III DEVEL	IV WESTC	V WELFA	VI AGRIC	VII USAID	VIII FCONF	IX CTRAD	X CRIEN	XI FOSTA	XII DIVER
AFG001	0.055338	-0.598791	0.767716	-0.171873	1.254413	-0.213712	-0.160058	0.424750	-0.175135	0.154405	-0.273211	0.132561
ALB002	0.158999	-1.119717	0.592315	-0.121427	-0.376393	-0.514129	-0.079500	0.142455	-0.354125	1.712154	0.102655	-0.413422
ARG003	0.166921	0.771177	0.929251	-1.042305	-0.634185	-0.980099	1.077686	0.237517	0.595132	-0.047734	-0.039455	-0.073164
AUL004	0.447550	0.743244	-1.936299	0.472358	-0.422046	-1.426276	-0.355372	-0.403039	1.043587	0.028494	0.054703	-0.203456
AUS005	0.458756	-0.942769	-0.826096	-2.407264	-0.574635	0.375167	-0.036092	0.116539	0.187351	-0.173342	-0.424157	-0.912575
BEL006	0.175700	0.594123	-0.912716	-0.911376	-0.173364	0.627193	-0.717930	0.156126	[illegible]	[illegible]	-0.274570	-0.371776
BOL007	0.152765	0.825565	0.590826	-1.079048	0.145454	-0.777484	0.154744	0.255124	-0.324071	-0.364549	-0.509252	0.446277
BRA008	-0.046564	0.099776	0.637115	-1.049342	0.116448	-0.488256	1.264201	0.145420	1.767429	[illegible]	-0.475770	-0.449555
BUL009	0.533353	-2.681913	0.337007	-0.447455	-0.517612	-0.110174	0.425963	0.553103	-0.735142	0.306272	0.187724	[illegible]
BUR010	0.077571	-0.512791	0.858633	2.437442	-0.185571	-0.596038	-0.033919	0.434262	-0.378656	-0.506402	-0.354017	-0.150717
CAM011	0.061443	-0.215656	0.734791	2.717402	1.141416	-0.595375	-0.415058	0.244687	-0.757362	-1.127115	-0.554300	0.592415
CAN012	0.330355	0.069617	-2.841599	-0.120613	-0.664777	-0.924719	-0.669675	-0.522320	0.545115	-0.115972	0.269644	1.706015
CEY013	0.276641	0.054107	0.462833	1.852737	-0.179152	0.625912	0.306503	0.344100	0.116142	-0.021127	-1.229527	-0.413372
CHL014	0.264940	0.704473	0.154576	-1.054522	-0.525549	-0.673367	0.304373	0.191733	0.530441	-0.734227	-0.165176	-0.574476
CHN015	-1.055770	-1.297333	0.595141	0.234053	0.472465	-0.591094	1.562191	-6.046243	0.504743	-0.661530	-0.685622	-0.806316
CHT016	0.512660	0.371777	0.392629	0.423240	-0.275494	2.411404	-1.804326	-4.744000	-0.425343	0.223774	0.453572	0.751955
COL017	0.179307	0.670204	0.447591	-0.907172	-0.099214	-0.745769	0.834135	0.245464	0.363374	-0.556420	0.110094	-0.488576
COS018	0.070007	0.776741	0.516646	-0.465637	-0.653763	-0.534756	-0.132834	0.059974	0.039004	-0.775555	-0.172171	-0.317516
CUB019	0.449495	-1.163535	0.118451	-0.451354	0.134326	-0.577246	0.257735	-0.111703	0.177720	-0.490077	0.113542	-0.515249
CZE020	0.019331	-2.875411	-0.684394	-1.340331	-1.582713	1.117222	-0.821970	0.260436	-0.762041	-0.722134	0.411275	-0.144012
DEN021	0.045574	-0.179547	-1.959745	0.530109	0.241065	0.441011	0.93[illegible]	0.416304	-0.519306	-0.735541	0.051181	-0.733009
DOM022	0.111143	0.437646	0.523841	-0.629559	0.203462	0.041173	0.051185	0.123553	-0.236265	-0.465533	-0.372427	-0.758562
ECU023	0.173535	0.724039	0.759931	-0.732512	-0.444135	-0.742747	0.111252	0.261503	-0.031713	-0.747277	-0.733025	-0.474777
EGP024	0.331555	-0.660726	0.337103	-0.310161	-0.144156	-0.676733	0.450049	-0.412771	0.546057	2.246545	-0.049372	-0.434755
ELS025	0.169737	0.659495	0.357405	-0.312115	0.064143	0.491675	-0.220352	0.225641	[illegible]	-0.751585	-0.744609	-0.735505
ETH026	0.459550	-0.116133	-0.471139	-0.319063	4.457160	-0.609442	-0.311546	0.247734	-2.013467	-1.137941	-0.116182	2.064558
FIN027	0.421577	-0.535276	-1.335642	0.322417	-0.756623	-1.731754	0.455564	0.120371	0.054627	0.214774	-0.201625	-0.178534
FRN028	-0.722565	0.656679	-1.364457	-0.460276	-0.534561	1.107769	-0.013742	0.355146	-0.315467	-1.181481	-0.145543	-0.623466
GHA029	0.230748	-2.011197	-1.390286	-0.744610	-0.098927	0.564612	-0.523535	0.021577	-0.444401	-0.563315	0.524461	-0.226664
CHA030	-0.512726	0.776475	-1.514424	-0.341946	0.474439	2.440773	-0.157550	0.543074	0.413726	[illegible]	-0.274775	-0.548256
GRC031	0.177530	0.441122	0.271654	0.175492	-0.512248	0.143168	0.364572	0.370636	-0.344313	0.223627	-0.111866	-0.215621
GUA032	0.074716	0.810777	0.547667	-0.604593	0.414475	-0.260414	-0.232065	0.060442	-0.304175	-0.575727	-0.452255	-0.227513
HAI033	0.403837	0.579371	1.265142	-0.971311	1.191730	0.744169	-0.829578	0.144429	-0.795755	-0.440734	-0.123455	0.117343
HON034	0.207042	0.612754	0.455832	-0.477367	-0.157630	-0.412755	-0.224032	0.335754	0.221174	-0.102315	-0.210066	-0.297472
HUN035	0.230945	-0.223055	-0.153534	-0.773756	-0.344114	0.064443	-0.093874	0.447485	-0.519172	-0.102474	0.198571	-0.144546
IND036	-0.146404	-1.262379	0.205576	-0.024507	0.218845	1.044578	7.005267	-0.183077	-0.505341	-0.104212	-0.101522	2.066856
INS037	0.112565	-0.052518	0.375842	0.274474	0.764351	-0.190546	0.104663	-1.097723	0.066006	1.594526	0.179727	-0.575471
IRN038	-0.044711	0.677594	0.541922	-0.157550	-0.495467	-0.334151	-0.549601	0.542434	-0.131344	0.242411	-0.192191	0.445756
IRQ039	0.137176	-0.360565	0.355506	-0.176475	-0.249700	-0.144590	0.150569	0.414100	-0.277553	2.100451	0.206279	-0.315577
IRE040	0.221535	0.352267	-0.272420	-0.493570	-0.725034	-0.171093	-0.167870	0.352700	-0.210244	-0.515520	-0.004117	-0.217581
ISR041	0.456221	0.332444	-0.741336	-0.554475	-0.982344	0.556404	-0.026604	0.066344	-0.155415	0.500241	-0.663154	3.444367
ITA042	-0.573717	0.306741	0.938674	-0.621345	-0.401426	2.234535	0.134821	0.256635	-0.157332	-0.521134	-0.265554	-0.721777
JAP043	-0.460765	1.557809	-0.145767	2.062485	-0.645169	1.597122	-0.359726	0.119577	1.044456	0.211171	-0.445291	-0.725444
JOR044	0.045124	0.041294	0.339341	-0.191540	-1.217715	-0.352644	-0.237575	0.150733	0.557747	2.451145	-0.274042	-0.521474
KOC045	0.071412	-2.477640	0.246325	0.756533	-0.917618	0.348423	-0.045742	-0.516376	-0.744751	-0.221143	0.272531	-0.427045
KOS046	0.179534	0.772411	0.676535	1.735303	-0.593782	1.785776	0.070958	0.066492	0.570647	0.102555	0.222291	-0.437440
LAO047	0.056555	0.086642	0.563932	2.522562	1.429564	-0.043412	0.192275	0.612553	-0.507754	-0.943888	-0.694847	0.584444
LEB048	0.247952	0.193557	0.405002	-0.211335	-0.136391	1.302595	-0.272123	0.209579	-0.271293	1.056441	-0.575312	0.039582
LBR049	0.176823	-0.029993	0.448058	-0.983952	0.949972	-0.493272	-0.438717	0.218203	-1.302340	-0.904358	0.334676	1.542779
LBY050	-0.065750	0.226057	0.061334	-0.576652	0.403346	-0.851616	-1.001901	-0.080591	-0.221452	2.251576	0.072339	0.111327

APPENDIX III-A (cont'd)

BANKS	I FLNER	II FORIE	III DEVEL	IV HESTC	V HELPA	VI AGRIC	VII USAID	VIII FCOMP	IX CTRAD	X CRIEN	XI POSTA	XII DIVER
PEK051	0.642395	0.073841	0.533460	-0.447015	-0.352599	-0.582071	-0.535102	-0.270944	0.129	-0.	0.12	-0.
NEP052	0.034354	-0.507048	0.911103	1.214179	2.835446	0.348673	-0.201278	0.317928	-0.344	-0.	-0.	-0.
NTHC53	0.402638	0.855504	-1.335867	0.102008	0.217128	2.974622	-0.216795	0.180675	1.134		-0.	-0.
NEW054	0.923103	0.770145	-2.092565	0.485120	-0.476354	-1.018807	-0.277615	-0.469224	0.027			0.
NICO55	0.174487	0.566145	0.729173	-0.777746	-0.195566	-0.694645	-0.475538	0.187752	-0.201	-0.727	-0.	-0.
NEP056	0.894598	-0.056649	-2.400656	0.590145	0.161135	-1.358289	0.547593	0.034265	0.109	0.294	-0.	-0.
CUT057	0.814884	-1.429716	0.502066	2.761242	-0.994092	-1.502955	-0.066330	0.960675	0.30		-0.	-1.
PAK054	0.052261	0.429632	0.678818	0.065986	0.034347	0.660748	2.113922	0.462984	0.319	2.602	-0.	0.
PAK059	0.316675	0.762278	0.216551	-0.289328	-0.592148	-0.871695	-0.272547	-0.121295	0.214	-0.	-0.	-0.
PAK060	0.172165	0.017857	0.853474	-0.535205	-0.252413	-1.179875	-0.446542	0.138045	0.374	-0.	0.744	-0.
PEP061	0.172624	0.655977	0.062456	-0.513807	-0.328212	-0.985131	-0.530579	0.086272	0.263	-0.	-0.	-0.
PHI062	0.232693	0.845035	0.522027	0.303258	-0.786763	1.024106	-0.571624	-0.177511	-0.614	-0.	-0.	2.
POL063	-0.324644	-2.218259	0.222102	-1.564735	-0.321318	0.894956	-0.073129	0.536470	-0.188	-0.	0.	-0.
PCR064	0.153165	0.438597	0.843391	-0.522749	-0.019286	0.665420	-0.375486	0.269097	-0.161	-0.	0.161	-0.
PUN065	0.054778	-2.371253	0.274955	-0.446433	-0.499152	0.242404	-0.027413	0.435543	-0.766	-0.	0.170	0.
SAU066	-0.025941	0.199649	0.725505	-0.394205	0.766396	-0.868583	-1.033079	-0.782234	0.962	2.	-0.	-0.
SPA067	-0.241078	0.670641	0.791350	-0.479751	0.354496	-0.677418	0.042575	-0.375454	-0.544	0.	0.	0.
SWE068	0.700697	-0.326646	-3.132100	0.486966	0.472936	-1.316256	0.476361	-0.347154	-0.243	0.	-0.	-0.
SWZ069	0.547300	0.124181	-2.306966	-0.029628	-0.051350	0.029122	-0.055928	-0.248289	-0.369	0.	-0.	0.
SYR070	0.117665	-0.502353	0.599354	-0.095363	-0.343938	0.116742	0.047858	0.449132	-0.982	1.	-0.	0.
TAI071	-0.005915	0.729035	1.140068	3.075236	-0.605123	-0.196510	-0.756936	0.230135	-0.100	-0.	-0.	-0.
TUR072	-0.125025	0.714435	0.812388	-0.148407	-0.968370	0.292232	1.347919	0.560097	0.020	2.	-0.	-0.
UNS073	0.379338	0.052610	-0.536051	0.029103	-0.110146	-0.876679	-1.435214	-0.323964	-0.679	-0.	0.	0.
USA074	-4.169038	-1.774191	0.630527	-0.013469	-0.340178	-0.685613	-0.376101	0.661910	0.598	-0.	0.	2.
URY075	-0.373402	0.404676	-2.143554	0.072347	0.816569	1.527751	0.066337	0.026781	0.947	0.	-0.	-0.
USS076	-7.412264	0.968632	-1.500242	0.136403	0.973836	-0.748621	-0.246350	0.264791	-3.972	0.	-0.	-0.
VEN077	0.344315	0.534562	0.060254	-1.053035	-0.739029	-0.819974	0.034921	0.140374	0.149	-0.	-0.	-0.
VEN078	0.051765	0.699730	-0.115346	-0.372182	-0.466202	-0.716195	0.046211	0.144521	0.125	-0.	-0.	-0.
VTA079	0.222677	-1.193531	0.661928	2.062474	-0.492208	-0.156512	-0.635829	0.101754	0.481	-0.	-0.	-0.
VTS080	0.056943	0.594540	0.429069	0.562004	0.175813	0.116809	0.917266	0.342830	-0.025	-0.	8.	-0.
YEM081	0.096262	0.005405	0.201815	-0.875574	0.412437	0.464628	-0.339290	0.385364	0.960	1.	0.	-1.
YUG082	0.601658	-1.364141	0.371540	-0.506045	-0.498782	0.402019	-0.673883	0.152647	-0.965	-0.	0.	1.

APPENDIX III-A (cont'd)

NATIONS	XIII COLON	XIV URAID
AFG001	0.543656	-0.968255
ALB002	0.273145	0.495034
ARG003	-0.588523	-0.000527
AUL004	1.955560	-0.941460
AUS005	-1.139694	0.054955
BEL006	0.525367	-1.541342
BCL007	-0.464128	0.249543
BRA008	-0.830697	0.107116
BUL009	0.074287	-0.942333
BUR010	0.594067	0.674962
CAM011	-1.613203	-0.457801
CAN012	-1.435768	-2.021
CEY013	-0.436345	1.0
CHL014	-0.544697	0.794374
CHN015	0.069668	1.403651
CHT016	-0.480775	-0.445745
COL017	-0.623478	0.189041
COS018	-0.133479	0.061397
CUB019	0.094920	-0.033
CZE020	-1.402545	0.525
DEN021	0.773404	2.481691
DOM022	-0.193567	0.270
ECU023	-0.145435	0.493
EGY024	0.370647	-2.036
ELS025	0.095	0.182
ETH026	0.254731	0.721
FIN027	-0.506170	1.610311
FRN028	1.578170	0.234
GAB029	-0.503	1.670
GMB030	-1.0	-0.033
GRE031	0.004	1.312
GUA032	-0.170	0.284
HAI033	0.220	-0.265
HON034	-0.192	-0.014
HUN035	0.157524	0.593
IND036	0.254656	-1.477
INS037	0.234749	-0.310
IRN038	-0.475	0.174
IRQ039	0.357102	-0.596
IRE040	-0.057	0.254
ISR041	-1.327	0.099
ITA042	-0.053	0.667
JAP043	-1.040	-0.648
JOR044	-0.460	0.484
KEN045	-0.448	0.383
KOS046	0.058	0.266
LAO047	-2.481	0.245
LEB048	-0.652	0.438
LBR049	0.074	1.227
LBY050	-2.217	-0.351

NATIONS	XIII COLON	XIV URAID
MEX051	0.113	-0.559
NEP052	0.316	0.65
NTH053	1.0	-0.593
NEW054	1.924	-0.029
NIG055	0.048	0.124
NOR056	-0.594	1.345
OET057	0.490	-1.0
PAK058	0.193	0.972
PAN059	-0.152	-0.104
PAR060	0.113	-0.139
PER061	-0.16	-0.428
PHI062	0.04	0.177
POL063	-0.156	-0.577
POR064	0.062	0.47
RUM065	0.231	-0.417
SAU066	0.206	-0.495
SPA067	2.717	0.1
SWD068	-0.4	0.918
SWZ069	-1.342	0.176
SYR070	0.0	1.0
TAI071	1.0	0.0
TUR072	0.0	1.419
UAS073	0.019	-0.901
USR074	0.299	1.513
URU075	1.0	-0.372
USA076	0.332	-0.702
VEN077	-0.481	0.220
VEN078	0.974	-0.922
VTA079	0.419	-1.0
WTS080	-0.419	0.205
YEM081	0.033	-0.237
YUG082	-0.153	0.786

APPENDIX III-B

FACTOR SCORES OF SEVEN ROTATED BEHAVIORAL SPACE BASIS DIMENSIONS, 1955 AND 1963

1) EXPLANATIONS

Kind of raw data: Original Data Set (N = 81)

Number of variables in raw data set: 17

Factor technique employed: Component Analysis

Rotation criterion: Varimax

Case: Dyads with China as the actor; e.g., CHN→Object Nations.
In the table, only names of object nations are printed.

APPENDIX III-B (cont'd)

2) 1955 DATA

OBJECT NATIONS	I TRADE	II FDIPL	III INDIP	IV ECAID	V NECOM	VI CONCO	VII VISIT
AFG001	-0.219938	0.326309	0.404109	-0.140545	0.050106	1.410541	-0.216233
ALB002	0.170971	1.539456	0.410663	0.153651	0.035062	0.17[illegible]	-0.539244
ARG003	-0.299545	-0.286799	-0.482110	-0.467038	0.239523	-0.70[illegible]	-1.00[illegible]
AUL004	-0.253026	-0.826613	0.101701	0.023542	0.245475	-0.5[illegible]1	-0.[illegible]3
AUS005	-0.156005	-0.642178	0.456830	-0.[illegible]	0.167026	-0.7[illegible]11	-0.[illegible]
BEL006	-0.178292	-0.551535	-0.382743	-0.214[illegible]	0.31[illegible]	-0.5[illegible]7	-0.[illegible]
BOL007	-0.156356	-0.548248	0.207313	-0.0[illegible]24	0.219[illegible]	-0.[illegible]	-0.[illegible]
BRA008	-0.258673	-0.727921	0.273772	-0.[illegible]432	0.2[illegible]7	-[illegible]	-0.2[illegible]171
BUL009	-0.246350	1.431237	0.133338	-0.354513	0.194146	-2.617[illegible]	0.5[illegible]20
BUR010	-0.255597	2.927060	-2.624789	-0.[illegible]	0.[illegible]187	1.521[illegible]	-1.[illegible]
CAM011	-0.037455	-0.454516	0.262810	1.056610	0.153359	1.333129	-0.1[illegible]57
CAN012	-0.221342	-0.647510	0.447225	-0.[illegible]463	0.176847	-0.[illegible]	-0.[illegible]156
CEY013	-0.177661	0.111621	0.307310	0.026626	0.311314	-0.[illegible]	-0.283467
CHL014	-0.318070	-0.626554	0.104177	0.334595	0.251192	-1.161[illegible]	-0.[illegible]717
CHT016	0.069285	-0.449355	0.275534	-0.157081	-0.5[illegible]36	1.4[illegible]	0.[illegible]250
COL017	-0.269745	-0.785658	0.076775	0.[illegible]	0.257358	-0.7[illegible]	-0.[illegible]412
COS018	-0.139763	-0.551173	0.[illegible]22	-0.146[illegible]	0.174769	0.1[illegible]	-0.[illegible]
CUB019	-0.165[illegible]	-0.564240	0.[illegible]411	-0.137756	0.15[illegible]73	-0.[illegible]	-0.[illegible]
CZE020	0.360[illegible]	1.311027	-0.3[illegible]	-0.442[illegible]	0.154912	-0.747[illegible]	2.[illegible]2
DEN021	-0.611763	2.100272	0.685914	-0.[illegible]1161	-0.[illegible]7	-0.[illegible]	-0.571[illegible]
DOM022	-0.069973	-0.470440	0.309374	-0.195373	0.183149	0.577[illegible]	0.00[illegible]
ECU023	-0.205664	-0.600605	0.413724	-0.114762	0.156377	-0.[illegible]	-0.194107
EGP024	0.263769	-0.668242	0.166209	0.[illegible]5136	0.[illegible]752	-0.791567	0.[illegible]
ELS025	-0.069973	-0.470440	0.309374	-0.1[illegible]73	0.182149	0.577[illegible]	0.0[illegible]
ETH026	-0.050557	-0.451817	0.294466	-0.[illegible]546	0.161259	1.175[illegible]	0.[illegible]
FIN027	-0.395260	2.592234	-0.164412	-0.624660	0.[illegible]652	-0.167[illegible]	-1.[illegible]47[illegible]
FRN028	-0.343205	-0.924518	-2.081186	-0.222[illegible]	-0.735797	0.19[illegible]54	0.[illegible]
GME029	1.646062	0.181698	-0.247485	-0.598572	0.717136	-0.6[illegible]7	4.0[illegible]72
GMW030	0.255322	-0.814376	0.534602	-0.14[illegible]67	-0.254814	-0.615207	-0.[illegible]
GRC031	-0.201594	-0.662849	0.413[illegible]	-0.111572	0.193164	-0.[illegible]	-0.132[illegible]
GUA032	-0.160048	-0.567304	0.362305	-0.136104	0.186034	-0.31[illegible]	-0.13243[illegible]
HAI033	-0.050557	-0.451617	0.294466	-0.[illegible]546	0.161259	1.17[illegible]	0.[illegible]
HON034	-0.106805	-0.507687	0.3[illegible]191	-0.173127	0.166528	0.5[illegible]	-0.[illegible]
HUN035	-0.2[illegible]636	2.102542	-0.336[illegible]	-0.1[illegible]115	0.19[illegible]	-0.771[illegible]	0.241765
IND036	0.213[illegible]01	0.9[illegible]714	-0.244165	-0.[illegible]	-0.376788	-0.[illegible]	2.[illegible]17
INS037	-0.[illegible]	0.740545	-2.[illegible]	1.5[illegible]	-0.14[illegible]	2.447[illegible]	[illegible]
IRN038	-0.294503	-0.806[illegible]	0.[illegible]	0.024[illegible]	0.20[illegible]40	-0.5[illegible]	-0.[illegible]
IRQ039	-0.232353	-0.677744	0.2[illegible]	-0.[illegible]43	0.22[illegible]	-0.[illegible]	-0.31[illegible]
IRE040	-0.122364	-0.529433	0.352757	-0.159317	0.162348	0.3[illegible]	-0.07[illegible]
ISR041	-0.469320	0.21[illegible]	0.24[illegible]	-0.0[illegible]177	0.150462	-0.[illegible]	-0.[illegible]31
ITA042	-0.129358	-0.745296	-0.291072	-0.[illegible]21626	0.226564	-0.[illegible]	-0.32[illegible]
JAP043	-0.302773	-1.561392	-7.127165	-0.3[illegible]43	-0.[illegible]707	-1.1[illegible]	-0.[illegible]
JOR044	-0.147558	-0.658445	-0.0[illegible]	-0.[illegible]	0.[illegible]	0.[illegible]	-0.[illegible]
KON045	0.424651	1.332646	0.5[illegible]7	0.[illegible]	0.13[illegible]2	-1.[illegible]	0.362476
KOS046	-0.029455	-0.502148	0.318222	-0.169962	-0.177767	0.[illegible]	0.[illegible]
LAO047	0.140495	-0.492576	0.243124	-0.200761	0.061295	1.62[illegible]7	0.1[illegible]
LEB048	-0.327550	-0.559350	-0.053596	0.149710	0.321713	-1.533[illegible]3	-0.[illegible]
LBR049	0.007690	-0.395945	0.249740	-0.24[illegible]	0.175590	1.77[illegible]	0.[illegible]71
LBY050	0.027106	-0.377322	0.234832	-0.252438	0.173700	1.968[illegible]	0.151[illegible]

APPENDIX III-B (cont'd)

OBJECT NATIONS	I TRADE	II FDIPL	III INDIP	IV ECAID	V NECON	VI CONGO	VII VISIT
MEX051	-0.226576	-0.822935	0.106595	[illegible]	0.261037	-1.100231	1.417522
NEP052	-0.249745	0.631525	0.595315	-0.02[illegible]	0.115178	[illegible]	-0.[illegible]
NTH053	-0.433367	1.294047	0.403162	-0.126745	0.095781	-0.0[illegible]513	-0.174365
NE-054	-0.233288	-0.799026	-0.158707	0.021404	0.273578	-0.054625	0.037[illegible]
NIC055	-0.048223	-0.453066	0.293928	-0.206011	0.174071	1.176744	-0.635116
NOR056	-0.465934	1.119629	0.575508	-0.157142	0.045551	-0.1[illegible]	-1.013365
CUT057	0.137749	2.213547	0.395139	0.746345	0.145536	-0.175556	-0.415216
PAK058	0.257620	-0.242050	0.235256	-0.440992	0.209[illegible]	0.43[illegible]	-0.0[illegible]
PAN059	-0.125626	-0.527628	0.354145	-0.126[illegible]	0.1[illegible]	0.361757	-0.955410
PAR060	-0.644335	1.673397	0.602979	-0.057461	0.003047	0.141645	-0.222669
PER061	-0.225279	-0.619425	0.428642	-0.103265	0.156267	-0.606[illegible]	-0.044621
PHI062	-0.097649	-0.511354	0.337573	-0.169565	0.139303	0.556517	3.76[illegible]
POL063	0.474072	1.434022	1.315043	-1.234843	0.152505	-1.311267	-0.166359
POR064	-0.165679	-0.579111	0.403272	-0.126177	0.13[illegible]	-0.710[illegible]	0.516743
RUM065	-0.244369	2.199558	-0.326711	-1.067435	0.202462	-1.324655	0.015404
SAU066	0.209505	-0.067534	0.237719	-0.486[illegible]	0.180701	2.042754	-0.214[illegible]
SPN067	-0.234021	-0.086120	0.236861	-0.057410	0.222044	-0.435555	-0.355496
SWD068	-0.976107	1.606618	-0.714776	0.194246	-0.013212	0.156419	-0.205[illegible]
SWZ069	0.057370	-0.544172	0.477822	-0.271890	0.205576	-0.59[illegible]287	-0.111395
SYR070	-0.179180	-0.649144	0.072202	0.073985	0.243146	-0.834456	0.012151
TAI071	-0.057368	-0.470847	0.309088	-0.192227	0.065135	0.955649	-0.156342
TUR072	-0.171293	-0.590298	0.395334	-0.172760	0.180264	-0.705145	-0.220[illegible]
UNS073	-0.218763	-0.616035	0.434134	-0.123435	0.1[illegible]	-0.[illegible]722	-1.216572
USR074	[illegible].470534	0.261534	-0.217566	-1.169700	0.250404	-0.152[illegible]	-1.252034
UNK075	-0.324556	0.829194	-0.959261	0.093133	-0.491644	-0.531651	-0.134587
USA076	0.136754	-0.260012	0.641462	-0.109136	-0.765065	-0.355689	0.560554
URA077	-0.436565	-0.939575	-0.475373	0.097941	0.158550	-0.[illegible]	-0.230241
VEN078	-0.134907	-0.712804	0.464245	-0.037511	0.149537	-0.957727	-0.304320
VTN079	1.507659	-0.047569	-0.473507	0.273175	-0.245422	-0.364519	0.136595
VTS080	0.050625	-0.409675	0.260269	-0.230974	-0.300352	1.804793	0.154230
YEM081	0.039354	-0.381875	0.237478	-0.247596	0.172790	1.972463	-1.196507
YUG082	0.264925	1.709136	-0.523664	-0.770093	0.008290	0.863084	-0.326935

APPENDIX III-B (cont'd)

3) 1963 DATA

OBJECT NATIONS	I INDIP	II TRADE	III FDIPL	IV ECAID	V NECOM	VI VISIT	VII OCNGO
AFG001	0.041354	0.104525	-1.149913	-1.241650	-0.111791	2.484747	1.560943
ALB002	0.542755	0.154509	-0.520674	3.424837	-0.712449	[illegible]	0.016367
ARG003	-0.289761	0.275287	0.710447	0.013037	-0.249319	-0.120754	-0.625203
AUL004	-1.035361	-3.120937	1.510355	[illegible]	-0.610923	[illegible]	-1.763669
AUS005	-0.427876	0.265947	0.625504	[illegible]	[illegible]	[illegible]	-1.504377
BEL006	0.008851	0.477758	0.835775	-0.116643	-0.337163	[illegible]	-1.479257
BOL007	-0.132521	0.198261	0.757113	-0.172241	-0.140741	-0.134637	0.546371
BRA008	1.070187	0.156497	0.646654	-0.347627	-0.332035	-1.171739	-0.140130
BUL009	0.138356	0.677247	-1.055331	-0.793271	-0.360450	-0.102141	-0.642030
BUR010	-0.307975	-0.450551	-1.771253	1.644374	-0.457765	[illegible]	1.264175
CAM011	0.268402	0.132475	-0.740742	0.524034	0.307631	[illegible]	2.181743
CAN012	-0.720703	-1.272514	1.102844	0.170078	-0.371241	[illegible]	-1.155427
CEY013	0.288864	-0.102434	-0.720334	-0.123304	-0.281443	2.442447	-0.217463
CHL014	-0.119894	[illegible]	0.772231	-0.080749	-0.274143	[illegible]	[illegible]
CHI016	-0.252788	0.198762	0.725639	-0.107415	0.657295	-0.246151	1.247745
CCL017	-0.417661	0.179569	0.566265	-0.245070	-0.299380	1.032615	[illegible]
CCS018	-0.326588	0.171527	0.706311	-0.130514	-0.110041	-0.211175	0.756950
CUB019	1.507758	-1.259736	[illegible]	4.710247	[illegible]	0.241140	[illegible]
CZE020	-0.482025	-0.944727	-1.590273	[illegible]	0.095185	[illegible]	-1.061594
DEN021	-0.558462	0.553553	-1.644514	-0.375036	-0.297959	[illegible]	-1.103075
DOM022	-0.214761	0.133204	0.716244	-0.164477	-0.094326	-0.231162	1.147125
ECU023	-0.303340	0.230315	0.764500	-0.103517	[illegible]	-0.152377	0.271569
EGY024	-0.135915	-0.431141	[illegible]	[illegible]	-0.411135	0.667400	[illegible]
ELS025	-0.320519	0.144734	0.711126	[illegible]	[illegible]	[illegible]	[illegible]
ETH026	-0.273344	0.132571	0.735335	[illegible]	[illegible]	-0.230771	1.241511
FIN027	0.263312	0.465023	-1.701827	-0.618705	[illegible]	[illegible]	-0.250282
FRN028	-0.210924	-0.515223	0.982253	0.102944	-0.172651	0.270564	-2.095183
GFE029	-0.150172	0.667503	-1.645125	[illegible]	[illegible]	[illegible]	0.111465
GFW030	-0.487617	-0.372041	[illegible]	[illegible]	[illegible]	[illegible]	-1.165497
GRC031	-0.345646	0.217623	0.676343	[illegible]	[illegible]	-0.142750	-0.166699
GUA032	-0.275310	0.177242	0.717107	[illegible]	-0.134427	[illegible]	[illegible]
HAI033	-0.315072	0.144463	0.716227	[illegible]	[illegible]	[illegible]	1.025265
HON034	-0.326460	0.146175	[illegible]	[illegible]	-0.124524	[illegible]	[illegible]
HUN035	-0.346702	0.360727	-1.576431	[illegible]	[illegible]	[illegible]	-1.440372
IND036	-0.416469	1.320142	[illegible]	[illegible]	0.174071	-0.421133	[illegible]
INS037	1.365225	0.213073	-0.411755	[illegible]	-0.265043	[illegible]	-1.077162
IRN038	-0.370584	0.224365	0.667413	-0.075225	[illegible]	[illegible]	-0.083277
IRQ039	-0.452209	0.226690	-0.674643	[illegible]	0.112153	[illegible]	0.340654
IRE040	-0.351155	0.175856	0.694504	-0.113337	[illegible]	-0.207341	0.352474
ISR041	-0.428594	0.340597	0.151234	-0.114244	-0.276655	[illegible]	-0.663217
ITA042	-0.340351	-0.222543	0.651324	-0.111777	[illegible]	[illegible]	-1.442734
JAP043	7.035242	-0.146600	1.457114	-2.596311	[illegible]	[illegible]	-1.034765
JOR044	-0.300776	0.129700	0.714413	-0.157441	-0.130675	[illegible]	[illegible]
KON045	3.576634	0.255446	[illegible]	3.632376	[illegible]	-1.755597	1.425733
KOS046	-0.345307	0.244559	0.690733	[illegible]	[illegible]	[illegible]	[illegible]
LAO047	-0.227147	0.291465	-0.196149	-0.145707	0.744557	[illegible]	1.625949
LEB048	-0.366678	0.219378	0.671461	-0.090557	-0.211377	-0.191911	-1.006502
LBR049	-0.306124	0.112914	0.723721	-0.144517	-0.276555	[illegible]	1.372385
LBY050	-0.316453	0.126594	0.714566	-0.172380	-0.102262	[illegible]	1.149183

APPENDIX III-B (cont'd)

OBJECT NATIONS	I INDIP	II TRADE	III FDIPL	IV ECAID	V NECON	VI VISIT	VII CONGD
MEX051	-0.005607	0.374563	0.704233	-0.113236	-0.275156	[illegible]	-0.710948
NEP052	-0.231488	0.351236	-0.928742	-0.435651	-0.004904	1.067336	1.151162
NTH053	0.409371	-0.010730	-1.473451	-0.780461	-0.338383	-1.561848	-0.245263
NEW054	0.252681	0.258422	0.854613	-0.353466	-0.164155	0.277765	-0.097137
NIC055	-0.320005	0.147637	0.711810	-0.155342	-0.103257	-0.223765	0.592[illegible]
NOR056	-0.454365	0.425413	-1.142940	-0.474322	-0.272772	-0.166139	-0.530223
CUT057	0.274505	0.416760	-1.487071	0.147157	-0.238493	-1.1[illegible]	0.511176
PAK058	2.023340	-0.156617	0.353043	-1.346602	-0.147013	1.401741	1.170450
PAN059	-0.341902	0.190135	0.692575	-0.121265	-0.155660	-0.205335	0.531695
PAR060	-0.412725	0.458054	-1.456178	-0.544055	-0.171452	-0.224604	0.445303
PER061	-0.328047	0.246160	0.667414	-0.053633	-0.234254	-0.146164	-0.143528
PHI062	-0.355472	0.203599	0.680721	-0.097237	-0.136035	-0.159426	0.223976
PCL063	-0.055639	0.271623	-1.583869	-0.284076	-0.536140	0.0[illegible]3164	-1.737662
PCR064	-0.316155	0.252145	0.652440	-0.049932	-0.157096	-0.176785	-0.455121
RUM065	0.766329	0.158863	-1.952750	-0.922427	-0.555[illegible]37	-0.425750	-0.720742
SAU066	-0.293381	0.108681	0.737074	-0.135451	-0.090263	-0.228520	1.463773
SPN067	-0.357029	0.255708	0.644018	-0.029254	-0.[illegible]75567	-0.165555	-0.651930
SWD068	-0.625946	0.340193	-1.674942	0.245425	-0.457300	-0.226716	-0.927629
SWZ069	-0.035092	-0.005342	0.493954	-0.215245	-0.256376	-0.377217	-0.581435
SYR070	-0.335680	0.156433	-0.822047	0.067211	-0.291174	-0.30[illegible]	0.360475
TAI071	-0.307270	0.173065	0.712766	-0.128020	-0.126750	-0.20[illegible]735	0.675525
TUR072	-0.367502	0.225759	0.670320	-0.071126	-0.275572	-0.135614	-0.534210
UNS073	-0.290485	0.149862	0.730114	-0.038576	-0.261395	-0.092815	-0.534055
USR074	0.107112	-7.777513	-1.566514	-0.997668	0.632743	-0.414217	1.146067
UNK075	0.613932	-0.320124	-1.191320	-0.772621	-0.018572	-0.860276	-0.920428
USA076	-0.428240	-0.360057	1.263755	0.167002	0.712704	0.21[illegible]651	-0.966623
URA077	0.095452	0.103740	0.554757	-0.283510	-0.152942	-0.473536	0.559449
VEN078	-0.251494	0.304143	0.717442	-0.101750	-0.053831	-0.079766	-0.537704
VTN079	1.126705	0.271021	-0.571353	3.225855	0.428785	0.197608	1.022724
VTS080	-0.134809	0.412780	0.807012	-0.061053	0.526185	-0.0140[illegible]	-0.041136
YEM081	-0.706618	0.053194	-0.389343	0.532334	-0.181302	-0.292[illegible]	1.055442
YUG082	-0.413951	0.575015	-1.137463	-0.320326	0.376512	-0.239500	-0.307802